DOCUMENT RESUME

ED 266 606 EC 182 021

AUTHOR Gallagher, James J., Ed.; Weiner, Bluma B., Ed.
TITLE Alternative Futures in Special Education.
INSTITUTION Council for Exceptional Children, Reston, Va.; ERIC Clearinghouse on Handicapped and Gifted Children, Reston, Va.
SPONS AGENCY Office of Educational Research and Improvement (ED), Washington, DC.
REPORT NO ISBN-0-86586-160-9
PUB DATE 86
CONTRACT 400-84-0010
NOTE 214p.
AVAILABLE FROM The Council for Exceptional Children, Publication Sales, 1920 Association Dr., Reston, VA 22091 ($17.50, $14.90 members; Publication No. P306).
PUB TYPE Books (010) -- Collected Works - Conference Proceedings (021) -- Information Analyses - ERIC Information Analysis Products (071)

EDRS PRICE MF01/PC09 Plus Postage.
DESCRIPTORS Child Advocacy; *Disabilities; *Early Childhood Education; Educational Technology; Educational Trends; Elementary Secondary Education; *Family Relationship; *Futures (of Society); Leadership Training; Legislation; Prevention; Public Policy; Research Needs; *Special Education

ABSTRACT

Twelve author-contributed papers from a 1984 conference examine the future of special education. The following titles and authors are represented: "The Institute for Research on Exceptional Children at the University of Illinois" (S. Kirk and W. Spalding); "The Family with a Child Who Is Handicapped: Research Focus for the 1980's" (J. Gallagher); "Families with Mentally Retarded Members: An Agenda for Research 1985-2000" (B. Farber); "Future Directions in Early Childhood Education for Exceptional Children" (M. Karnes); "The Future of Early Childhood Special Education: A Perspective on Prevention" (K. Scott and D. Carran); "Technology and Special Education Futures: Paradigm Shift" (S. Ashcroft); "Technology: A Look Into the Future for Special Education" (L. Stolurow); "The Center for Studies in Education and Human Development: A Programmatic Approach to Research in the Area of Deafness" (D. Moores); "Leadership Training Models for the Future" (C. Howe); "A Proposed American Academy of Scholars in Education of the Handicapped" (L. Dunn); "The Future of Legislative Advocacy for Exceptional Children" (E. Boggs); "Public Policy and Special Education: An Unfinished Agenda" (E. Martin). (CL)

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Alternative Futures in Special Education

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and Bluma B. Weiner

ERIC

A product of the ERIC Clearinghouse on Handicapped and Gifted Children

The Council for Exceptional Children

EC182021

Library of Congress Cataloging-in-Publication Data
Main entry under title:

Alternative futures in special education.

"A product of the ERIC Clearinghouse on Handicapped and Gifted Children."
Papers from a conference held in September, 1984 to honor Samuel A. Kirk.
1. Exceptional children—Education—United States—Forecasting—Congresses. I. Gallagher, James John, 1926–. II. Weiner, Bluma B. (Bluma Beryl), 1915–. III. Kirk, Samuel Alexander, 1904–. IV. ERIC Clearinghouse on Handicapped and Gifted Children. V. Council for Exceptional Children.

LC3981.A68 1985 371.96'0973 85-25507
ISBN 0-86586-160-9

A product of the ERIC Clearinghouse on Handicapped and Gifted Children.

Published in 1986 by The Council for Exceptional Children, 1920 Association Drive, Reston, Virginia 22091-1589.

This publication was prepared with funding from the U.S. Department of Education, Office of the Assistant Secretary for Educational Research and Improvement, contract no. 400-84-0010. Contractors undertaking such projects under government sponsorship are encouraged to express freely their judgment in professional and technical matters. Prior to publicauon the manuscript was submitted to The Council for Exceptional Children for critical review and determination of professional competence. This publication has met such standards. Points of view, however, do not necessarily represent the official view or opinions of either The Council for Exceptional Children or the Department of Education.

Printed in the United States of America.

To Samuel A. Kirk who has never ceased his efforts on behalf of exceptional children or his encouragement of excellence of the professionals who serve them.

Dr. Kirk, an advocate and statesman, is recognized with this publication by his colleagues and The Council for Exceptional Children, the professional association he has served so well.

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Preface

The chapters in this volume were prepared to honor one of special education's pioneers, Samuel A. Kirk.

For the past 40 years, in the field of special education the name of Sam Kirk has been synonymous with thoughtful inquiry, professional integrity, and responsible advocacy. His pioneer work in mental retardation in the 1940's and 1950's evolved into conceptual leadership of the new field of learning disabilities in the 1960's and 1970's. His thoughtful counsel is still sought in both of these areas. In addition, he became one of the first special educators to provide leadership at the federal level, having served for a brief time in the U.S. Office of Education in the 1960's.

Sam was the Director of the Institute for Research on Exceptional Children at the University of Illinois for almost 20 years, and in that capacity he turned out a regiment of students who staffed leadership positions in a variety of special education roles across the nation. He also organized a multidisciplinary staff that made numerous contributions of their own in research and leadership training.

In September, 1984, many of his former colleagues and students gathered once again at the University of Illinois at Champaign-Urbana to help celebrate his 80th birthday. The manner of the celebration was vintage Sam Kirk. There would be, by his direction, no soggy reminiscences, no maudlin reconstruction of the past, but instead an attempt to look hard at the future of special education. The papers presented in this volume represent the contributions of some of the people at that conference. The varied perspectives and backgrounds of the contributors are apparent. The topics range from early childhood to families of handicapped children, the new uses of technology, leadership training, and public policy.

We are particularly appreciative of the presence at the conference of Dr. Elizabeth Boggs, whose leadership in special education advocacy has been a continuous and significant factor for decades, and of Dr. Edwin Martin, who served for over 10 years as the director of

the Bureau of Education for the Handicapped in the U.S. Office of Education. These papers are designed as a contribution to the field of special education, but they also represent a small thank-you to Sam for his contributions to the careers of all of us who were associated with him.

James J. Gallagher

CHAPTER 1

The Institute for Research on Exceptional Children at the University of Illinois

Samuel A. Kirk
Willard B. Spalding

This article was written in the early 1950's to describe the new Institute for Research on Exceptional Children designed by Dr. Samuel A. Kirk, which was to set the stage for two decades of productivity in the field of exceptional children and through which most of the conference participants worked as faculty or as students.

In the summer of 1952 President George D. Stoddard recommended, and the Board of Trustees of the University of Illinois approved, the organization of an Institute for Research on Exceptional Children. It is the purpose of this article to explain the functions of the Institute and the reason for its development, since this is the first Institute of its kind established by a University.

THE PRESENT SITUATION

Exceptional children are those who deviate from the average in physical, social, or mental characteristics to such an extent that they are

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unable to profit sufficiently from the program of the conventional school and require special provisions for their care, education, and development. These children are either mentally retarded, mentally gifted or talented, visually defective, auditorially defective, physically crippled, defective in speech, or emotionally and socially maladjusted. Another phrase that has been used for the word "exceptional" is "handicapped and gifted."

The number of children who are handicapped and gifted in the United States is large. It is estimated that they approximate 4,000,000 individuals.[1] Some of these children are in special classes such as those for the deaf, the crippled, and the mentally retarded. Some of the deviates are in institutions for mental defectives, deaf, blind or delinquent. Some of these children are in the regular classes of the public schools. Some remain with their parents and do not attend school.

Public provisions for handicapped children have been increasing gradually. In 1900 there were few classes for exceptional children in public school systems. By 1936 the enrollment in special schools and classes rose to 297,513 pupils. By 1940 the number increased to 313,722. In spite of the war, lack of classroom space and lack of teachers the enrollment rose to 378,052 pupils by 1946.[2]

The number of exceptional children in institutions is also increasing. An example of the increase in this group is found in the size of the resident population in all institutions for the feeble-minded and epileptic in the United States. In 1904, 14,743 individuals were institutionalized. In 1930 the figure was 72,565. By 1946 the figure had grown to 119,456. These figures include adults, many of whom were committed to institutions as children.

The increase in enrollment in special schools and special classes and in institutions is reflected in increased costs. Public concern for better provisions for exceptional children has led to increased legislative appropriations. Illinois affords an example of mounting expenditures. In 1943, the Illinois legislature appropriated approximately six million dollars a year for institutions and public school classes for handicapped children. By 1951 the state legislature appropriated approximately twenty million dollars a year. This appropriation supported public school classes as well as state institutions and agencies dealing with handicapped children. The appropriation was only a part of the cost of care and education of exceptional children and does

[1]Martens, Elise H., "Needs of Exceptional Children," *U. S. Office of Education, Leaflet No. 74*, U.S. Government Printing Office, Washington, DC 1944, p. 4.

[2]Statistics taken from *Biennial Survey of Education in the United States; Statistics of Special Schools and Classes for Exceptional Children*, 1938-40, and 1946-48, Federal Security Agency, U.S. Office of Education. U. S. Printing Office, Washington, DC.

not include local community costs or services from private agencies and associations.

It is difficult to determine the reasons for this recently accelerated interest in exceptional children. Some facts indicate that handicapping conditions are increasing in our society.

It is impossible to ascertain definitely whether or not the ratio of handicapped children to normal children is changing, since comparative statistics are lacking. Even an adequate survey today of the extent of handicapping conditions would not answer the question, since adequate surveys have not been made in the past. Such a survey would, at least establish a base for a study of future trends.

Medical science has decreased substantially the infant mortality rate, especially the mortality rate of children with congenital defects. To quote from Benda:

> The infant mortality studies of the city of New York, for instance, show that in 1910, 113 newborn died out of every 1,000 births; in 1920, 85 newborn died out of the same number of births. Among the causes of death, congenital debility and malformations ranked first with a rate of 35.3 per 1,000 live births. Other causes were: gastro-intestinal disorders, 16.4; respiratory disorders, 20.0; contagious disease, 5.9. During the ensuing period of 29 years, the infant mortality rate fell from 85 to 25 in 1949.
>
> Such spectacular declines indicate a great progress in medical science. However, it has attracted little attention that in the same period the mortality rate for congenital debility and malformations has been cut in half. In 1949 the mortality rate for malformations fell to 16.8.
>
> *Thus, 19 newborn out of 1,000 live births who, as late as 1920, would die of congenital factors, survived in 1949.*[3]

In addition to a decrease in infant mortality medical science has prolonged the life span of some defectives. The use of antibiotics has, for example, increased the life span of the mongoloid defective.

If it is true that handicapping conditions are increasing in our society, it follows that the number of parents with handicapped children is also increasing. They are numerous enough to make effective organizations and obtain large appropriations from legislatures. They tend to increase public concern over handicapped children and thereby increase public provisions.

THE NEED FOR A RESEARCH CENTER

In 1952 most of the hundreds of institutions, both public and private, are overcrowded and have long waiting lists. Additional public school

[3]Benda, Clemens E. *Developmental Disorders of Mentation and Cerebral Palsies*, Grune and Stratton, New York, 1952, p. xx.

classes for handicapped children are being activated as fast as classroom space and funds can be made available and teachers can be trained. Positions in classroom teaching, in supervision, and in college and university teaching are awaiting candidates. This demand for service personnel draws into the teaching and administrative jobs most of the limited group of qualified people in the field. Specialists have little time for research because of the increasing demands for services to children. Research in this area has been much neglected.

Extensive and intensive study of handicapped and gifted children has not increased in proportion to the increase in services and provisions to the ever increasing number of exceptional children. One reason why research has not kept pace with service is the lack of highly trained researchers who know the problems in this field. At present, research consists largely of isolated master's and doctor's theses or the by-products of other research. Such studies as have been made have usually been dropped by the participants upon completion. Very few researchers are doing long-term studies or are devoting their lives to significant research in this area.

The major research on handicapped children has been primarily in the medical and psychological fields. The research in these areas has been focused primarily on diagnosis. When physical handicapping conditions can be corrected by the medical profession, the child is no longer "an exceptional child." The child who is handicapped is one who, after medical treatment, continues to be visually defective, auditorially defective, or mentally defective. The area of the socially maladjusted and the gifted are not primarily medical problems, and little medical work has been done in these areas.

Contributions to programs for exceptional children have come from psychology, education, sociology, medicine, biology, speech, and many other areas of knowledge. Educating an exceptional child requires a physical, neurological, and psychological examination, as well as programs of social and educational planning. One discipline alone cannot provide the facts needed to understand and help the exceptional child. Research in the field of exceptional children, therefore, should be interdisciplinary. There has been little if any research of this kind. No major attempt has been made to coordinate the various disciplines so that co-operative research can produce major contributions and advance knowledge about exceptional children. So far psychology studies one aspect, medicine another, while the social worker, the institutional worker and the educator do the best they can with the influx of children needing help. There has been no agency to make systematic studies, advance knowledge, and transmit this information to workers in the field.

There is reason to believe that extensive studies of deviating children will provide major contributions to the understanding of normal children. What is learned about the concept formation, language development, thought processes, perception of the world, family problems, and similar items will undoubtedly yield clues to the way in which these same behaviors are carried on by normal children. Examples of such contributions are not difficult to find.

The educational movement introduced by Dr. Marie Montessori in the latter part of the 19th Century was stimulated by her initial studies and work with defective children. The recognition of individual differences and the mental measurement movement was evolved by Alfred Binet in the earlier part of the 20th Century when, as an experimental psychologist, he was assigned the task of studying and identifying the educable mentally defective in France. The present emphasis on projective techniques and the emotional structure of man was an outgrowth of the studies of Rorschach in 1922, who was working with emotionally abnormal individuals. Genetic psychology and modern psychological theory have been greatly influenced by Freud whose work was stimulated by the study of neurotics.

THE ORGANIZATION OF THE INSTITUTE

The unifying objective underlying the organization of the new Institute for Research on Exceptional Children is to focus the theories and methodologies of the various social sciences on the study of the exceptional child. The purpose is to improve current understanding of the problems and needs of handicapped and gifted children and to make more effective the work of public and private agencies in their behalf. The Institute is interdisciplinary, with its roots primarily in the disciplines of psychology, sociology, education, and related areas.

The Institute also maintains a cooperative relationship with the state Departments of Public Instruction and Public Welfare. It will serve as a research facility which may be used by the cooperating agencies in achieving their objectives.

The Institute is a unit within the University and with a separate budget. It is administered by a Director. It has a full-time professional staff supplemented by part-time faculty members holding professional ranks in one of the departments of the University, and research associates and graduate assistants. Personnel from the Department of Public Instruction and the Department of Public Welfare are associated with the Institute on research projects.

An Advisory Committee has been appointed with representatives from the College of Education, the Department of Psychology, and

the Department of Sociology within the University; and with representatives from the Department of Public Instruction and the Department of Public Welfare within the state organization.[4] The committee suggests guiding principles and policies which will enable the Institute to more fully realize its purposes.

Research on exceptional children is conducted in those localities where exceptional children are found in sufficient numbers. Such numbers are found in special classes in local school systems and in state and private residential schools. With the exception of gifted university students, of which there are many, a university does not ordinarily provide facilities for handicapped children of various kinds. Although the Institute is located on the Urbana campus, much of the research will continue to be conducted in city school systems, and in residential schools.

Funds for the operation of the Institute are obtained from a number of sources. The University employs a permanent staff who spearhead significant projects in their areas of interest. The Departments of Public Instruction and Public Welfare have among their employees professionally trained men and women who are carrying out research in co-operation with the Institute or with the help of the University Institute Staff. Futher funds for special projects are obtained from private foundations and governmental agencies.

THE RESEARCH PLANS OF THE INSTITUTE

The purpose of the Institute is to extend research and advance knowledge in the social sciences in relation to exceptional children. Present plans for the Institute call for four areas of major endeavor. The first is a study of the effects of *extrinsic* factors on the learning, motivation, adjustment, and general development of deviating children. Such projects usually deal with the ways in which training, culture, environment, and social class affect the development of handicapped and gifted children. A second group of projects deal with the effects of *intrinsic* factors of disability—motor, sensory, and mental—on the

[4]The members of the Advisory Committee are:
Dr. Oscar Chute, Superintendent, Evanston Public Schools, Evanston, Illinois;
Dr. William W. Fox, Superintendent, Lincoln State School and Colony, Lincoln, Illinois;
Mr. Ray Graham, Director, Division of Education for Exceptional Children, State Department of Public Instruction, Springfield, Illinois;
Dr. Roman Haremski, Superintendent of Child Welfare Services, Department of Public Welfare, Springfield, Illinois;
Dr. J. McVicker Hunt, Professor of Psychology, University of Illinois;
Dr. Van Miller, Professor of Education, University of Illinois;
Dr. Ernest Shideler, Associate Professor of Sociology, University of Illinois.

development and adjustment of the handicapped. A third effort will furnish opportunities for advanced graduate students to study the problems involved in these fields. A fourth endeavor of the Institute will disseminate scientific information to workers in the field.

A more concrete picture of the studies planned or already begun at the Institute is given in the following descriptions. Some of these are already underway whereas others will be undertaken when further funds become available.

Research to Determine the Effects of Pre-School Education on the Social and Mental Development of Children who Show Slow Mental Growth at an Early Age

This project is placed first because it is already underway at the University of Illinois. A nursery school for young mentally retarded children was started in January of 1949. This includes a community school, an institution school, and contrast groups in a neighboring community in a neighboring institution. It is designed to test the assumption, among others, that adequate preschool education will make it possible for children with slow mental growth to progress more satisfactorily in the regular public schools. Such a project must be continued for at least ten years before one can be certain of the effects of such education in the rehabilitation of young mentally handicapped children. This project is currently being supported from state funds with substantial support for three years from the National Institute of Mental Health of the U.S. Public Health Service.

The Effects of Intensive Specialized Instruction on the School Adjustment and Achievement of Retarded Children at the Age of Six

The plan of the project is to identify children of low intelligence who have been admitted into the first grade during the month of September. Children who show low performance on individual intelligence tests and on reading readiness tests will be used for the experiment. It is anticipated that each two years a group of retarded children will be selected from these first grades during the month of September, leaving a control group in the regular first grades. The experimental group obtaining specialized instruction in a special school will remain in the special school for two years. They will then be placed in an appropriate class in the public school system. The control groups who will have been selected at random from the same population will continue in the regular grades for the same two years. Three years following the specialized experience, the two groups will be compared

on measures of social adjustment and educational achievement. Such an experiment will assist us in determining the effects of specialized instruction on the prevention of school maladjustment and on the social and educational development of retarded children.

Research on the Education and Care of the Mentally Deficient

The number and size of institutions for the feebleminded have increased since their establishment in 1848. In spite of this growth they are now from 20 to 50 per cent overcrowded. Many parents prefer to keep their severely retarded children at home and have them cared for in the local community. Recently a national organization of parents of severely retarded children has come into being. State legislatures are being requested to appropriate funds so that local school systems can provide for the care and education of the sub-special-class child in the community setting. But little or no research has been done which can serve as a guide either for parents or for the community. No one really knows how much those children can improve under training, what community provisions can be made, or the effects of such programs on the family. Research in this area would call for experimental laboratories to study such children and their parents.

In this area there are a number of problems needing investigation. One pilot project currently underway is designed to evaluate the changes in behavior of severely retarded children and also changes in parental attitudes and aspirations following training of the child in a day school. The project is being carried on in cooperation with a State Department of Public Instruction, a school system, and a parents association.

Day schools for severely retarded children enroll a considerable number of Mongolian children. Since Mongoloid children usually died before or at the adolescent level, few scientists have bothered to study their psychological and social characteristics. Present information about these children is largely of a medical descriptive nature. Psychological and sociological studies are sporadic and meager. Advances in medical science, however, have lengthened the life span of the Mongolian. It is necessary, therefore, that we survey the psychological and social characteristics of these children before we can organize an intelligent training program. Currently one such project is underway in cooperation with the Illinois state institutions for mental defectives.

Sociologists have made numerous studies of the effects of domestic discord or a broken home on the development of a child. There have been no extensive studies on the interaction in the other directions; namely, the effects of a handicapped child on the family. This area

of study therefore deals with the effects of a mentally defective child on the family and the effects of a school for such a child on the parents and siblings.

Studies on Gifted Children

Little progress has been made in the differential education of gifted children. We have discussed quite intensively and emotionally the relative effects of acceleration, special classes, and enrichment of curriculum. We are unable to agree on the best programs because we do not have sufficient facts. Intensive studies of superior children have been made by Terman. These studies have been concerned with the characteristics—social, mental, physical, educational, and vocational—of gifted children. We do not know precisely how these children attain talents, how they are motivated, how they learn, the relation of intellectual powers to motivation and adjustments, and the relative effects of "nature" and "nurture" on their development.

One interesting and fundamental experiment in this area would be to determine the effects of child-rearing practices upon the development of intellectual powers of children.

There have been but a few studies on the genesis of these characteristics. The hypothesis that a genius is "born that way" is accepted blindly. Longitudinal studies, beginning in infancy, are needed to determine the factors which result in genius. First will be a pilot study of the child-rearing practices of parents of superior children compared to the child-rearing practices of parents of average children. Following this pilot study a training program can be outlined for use in cooperation with parents of a random group of babies in an average population. The results of this program will be compared to trial and error child-rearing practices. Such a study must continue for approximately ten years to determine the effects of well-planned childrearing practices and nursery school and kindergarten provisions, on the social and educational adjustment of children at a later age.

Research in Somatopsychology

It is usually not possible to place individuals under physical stress for long periods of time in order to develop and test hypotheses about the effect of stress upon the development of the personality. But this is not necessary with the crippled child. The stress is created by the disability. It is said that they have three major handicaps: (1) their physical disability, (2) their self-concept and attitude toward their disability, and (3) the attitude of society toward the handicapped individual. This three-fold hypothesis should be tested by scientific means.

At the present time, one project is underway at the Institute which attempts to test some of these hypotheses. The current study is "A Study of the Social and Emotional Development in Twins, One of Whom is Cerebral Palsied." This study is being conducted on 30 pairs of twins, in which one of the pair is cerebral palsied.

Finding out more about the nature of the handicapped will be a great step forward. Developing educational programs which are based upon known principles will mean further progress. But both will make little change in the lot of the handicapped unless means are discovered to fit them into the ongoing life of the community. A study of the attitudes of employers, customers, public service, and a host of other key persons with whom the handicapped come in contact is needed. Procedures for changing these attitudes must be developed. And the perceptions which the handicapped individual has of the attitudes of others toward him and his handicap must be taken into account. Many studies are needed in this area if vocational rehabilitation of the handicapped is to be put on a scientific basis.

The Development of Diagnostic Instruments

Before handicapped children can be rehabilitated, full information about the nature of the defects and its effect upon the personality of the child must be available. Special tests are needed. Some of those indicated are motor proficiency tests for the crippled, qualitative tests for children with brain injuries, language tests for the deaf, and others designed to study abilities and disabilities. Tests are needed by which progress in various areas of treatment and remediation is measured.

Research in the Diagnosis, Educational and Social Treatment and Rehabilitation of Cerebral Palsied Children

Much money has been given by individuals for the care and education of children with brain injuries. Research is almost entirely in the medical area. Very little has been done to determine the ways in which the brain-injured child thinks, perceives, learns, feels, or socializes. Progress in this field will require social, psychological, and educational studies. The education of the cerebral palsied requires a two-dimensional approach (1) education according to the degree of intelligence, and (2) education according to the quality of the defect resulting from the brain-injury. Such education awaits guidance and leadership from significant psycho-educational research in this area which has not yet been initiated.

Studies of Language Disorders

Language is the basic area in which men differ from animals. Many disabilities in humans affect language. Children who are mentally defective, children with brain injuries, and children who are deaf and hard-of-hearing, all have language disabilities. Thus far, abnormal language development has been studied primarily with aphasics, and particularly with adult aphasics resulting from brain injuries during the war.

A current study is underway in the Institute entitled "An Investigation of the Disparity Between Mental Capacity and Language in Deaf Children." This study is being conducted in cooperation with the Illinois School for the Deaf. It is a study of one factor in language development with children whose basic disability is language.

Research on the Mental Development and Thinking Processes of Children with Sensory Handicaps

Very little is known about the way in which blind or deaf children perceive the world and form concepts about their relations with it. Learning more about this would lead to the development of better methods of therapy for children with sensory handicaps. It also will lead to a better understanding of human behavior in general. This research calls for considerable equipment, which is one of the reasons why so few people are presently involved in it.

A current study now being carried out by members of the Institute for Research on Exceptional Children is "A Study of the Cutaneous-Kinesthetic Elements in Braille Learning Behavior of the Blind." This project is being carried out in cooperation with the State School for the Blind. A second study "A Study of Frustration on Matched Blind and Non-Blind Adolescents" is also being investigated using as subjects individuals from the Illinois School for the Blind and from other similar institutions.

Training Workers in Research Methodology in Problems of Handicapped and Gifted Children

The small number of workers who have been trained in research methodology appropriate for studying deviate children is a major reason for lack of progress in this area. Many colleges and universities have delayed opening departments for the study of handicapped and gifted children because of the lack of adequately trained personnel.

One of the major purposes of the Institute is to provide a laboratory for the training of advanced graduate students in the problems of

handicapped and gifted children and in research methodologies which can be used to solve some of these problems. It is the hope of the Institute that more highly selected students at the advanced level can be encouraged to pursue this field under assistantships and fellowships. In addition to meeting the requirements for a doctor's degree in one of the departments of the university, such students will be encouraged to assist with research projects and to carry out projects of their own related to the general program for exceptional children.

Other Studies

The projects listed above are but a few of the studies which should be made. There are many related problems to those cited as well as many others that will evolve as studies are completed. The Institute will provide opportunities for those with creative abilities to test their theories and hypotheses.

SUMMARY STATEMENT

The Institute for Research on Exceptional Children was organized at the University of Illinois to advance knowledge in the field in behalf of handicapped and gifted children. The major features of the Institute may be summarized as follows:

1. The Institute is inter-disciplinary within the University. The problems of exceptional children will be studied by scientists from various fields.
2. The Institute is inter-agency. It is a cooperative effort between the University and the Departments of Public Welfare and Public Instruction. It is anticipated that the pooling of personnel and resources from these three state agencies will make significant research projects possible at a minimum cost to the citizens of the state, and to research foundations interested in this area.
3. The Institute will continue to plan major projects of theoretical and practical significance for the care and education of exceptional children. State, Federal, and private agencies can utilize the Institute to facilitate the advancement of knowledge in this field.
4. The Institute will provide faculty and facilities for the training of advanced graduate students, providing them with assistantships and fellowships to assist them in becoming more efficient in service and research.
5. It is anticipated that the general field of child development will profit from new knowledge obtained from studies on deviating children.

CHAPTER 2

The Family with a Child Who Is Handicapped: Research Focus for the 1980's

James J. Gallagher

The emergence of the family of handicapped children as a major focus of attention for both the clinician and the researcher appears to be a recognition of several fundamental facts. Bailey and Simeonsson (1984) believe that the greater attention paid to the family involves the recognition that:

1. Families have an important role in the planning process.
2. Families can serve as teachers of their children.
3. Families of handicapped children have unique needs and may themselves need to be targets of intervention. (p. 39)

One could add to this list that professionals have unique needs, as well, to be successful at their jobs. Other members of the family may, in fact, be more responsive and more open to productive change than would be a severely or profoundly retarded child and thus provide a more satisfactory focus for the professional's attention.

In this chapter we will summarize the major topics to be addressed by reviewing the literature on each of these questions:

1. Is having a child with handicaps a unique problem marked by special and unique stresses or merely one of the cluster of chronic

stresses such as unemployment, divorce, moving in of an elderly parent, chronic or terminal illnesses?
2. What are the stressors that impact on the family who discovers it has a child with handicaps?
3. What are the external forces in the family and society that ease, or make more severe, the impact of the stressor?
4. What are the important sources of support that can be provided to the family?
5. Do the family stresses change in some developmental fashion as the child and family mature?
6. What models of family functioning have been found to be useful in conceptualizing this problem?

FAMILY STRESS MODEL

A conceptual model would be helpful in trying to grasp the complex interrelationships present in this situation (Crnic, Friedrich, Greenberg, 1983). One of the most well-known models for characterizing family stress was produced by Hill (1958) in his ABCX Stress Model. (See also Bristol & Schopler, 1983; McCubbin, 1979.) Hill postulates that whether or not a particular stressor would precipitate a family crisis depended on three major components—first, (A), the characteristics of the stressor; second, (B), the family resources available; and third, (C), the perception of the situation of the family. These three ABC factors combine in a multivariate fashion to predict a resultant of family adaptation (X). This model was further developed by Burr (1973) to deal with postcrisis adaptation and by McCubbin and Patterson (1981), the AaBbCcX model, to take into account the accumulation of other stresses, the social context of family response to stress, the role of active coping, and the range of possible positive and negative outcomes. The model successfully predicted adaptation in families with developmentally disabled children (Bristol & Schopler, 1983) and will be used as the basis for this discussion. This multivariate model is helpful in explaining diverse adaptive patterns and combinations of related factors. If adaptation is a product of three forces, then the combination of a severe stressor with strong parental coping skills and positive perceptions may yield similar adaptive results to that of mild stressors when combined with poor coping skills and a negative perception.

Hill (1958) defines a *stressor* as a crisis-provoking event or situation for which the family has little or no preparation. While the presence of the handicapped child is stressful in its own right (Tew, Payne, & Laurence, 1974), it may also create a combination or pattern of secondary stresses. A number of reports indicate that the family may

experience severe financial problems that are related to the attempts to care for the handicapped child (Holroyd, 1974; McAndrew, 1976). A pileup of other financial, personal, and social stresses was noted to be significantly predictive of family adaptation in the Bristol and Schopler (1983) study of developmentally disabled children.

Can we predict what level of stress can be expected in families with handicapped children? When the family first became the focus of attention, most of the evidence was clinical, presented in a case-by-case fashion. It did not answer a fundamental question, namely, is what we are observing in this one family true of almost all families, most families, some families, or a very few families? A broader approach, through research, is needed to answer the question of how generalizable these observations on specific families might be.

Embry (1980) has reported evidence of parental stress that appears to lead to handicapped children being more at risk for child abuse. Harsh parental behavior toward these children has been reported in a number of other instances (Gaines, Sandgrund, Green, & Power, 1978; Gath, 1972; Sherman & Cocozza, 1984; Stevenson, Graham, & Dorner, 1978).

Rutter (1979) was one of the first investigators to suggest that there may be a combination of or accumulation of stressful events that may produce harmful outcomes. He reported that it is likely to be the *quantity* of stresses that may predict serious maladaptive child behavior. However, Hetherington (1984) suggested in her review on stress in the family that if individuals go through a series of negative life events which they have been able to control or deal with satisfactorily, they may emerge as more competent and resilient individuals than those who have either been overwhelmed by unresolved traumatic experiences or who have encountered little stress in the course of development (p. 10).

Stressors (A)

As pointed out by Farber (1959), there appears to be a two-stage effect of this stressor (having a handicapped child) on the family. One is a phase of *symbolic death*, which causes a grieving process that has been noted by a number of observers (Solnit & Stark, 1961). The symbolic death of the normal and healthy child whom the parents had anticipated causes a grief process which resembles that found in parents upon the death of a young child (Blacher, 1984). The second source of stress is brought on by the daily care and management problems that the handicapped child presents (Beckman-Bell, 1980).

What characteristics magnify the impact of the handicapped child on the family? Some of the dimensions, such as the nature of the

handicapping condition, have yielded contradictory results. In a number of studies, the nature or severity of the handicapping condition does not seem to play a significant role, but in others it does (Bradshaw & Lawton, 1978). Holroyd and McArthur (1976) contrasted the amount of stress suffered by parents of children with autism, children with Down's syndrome, or child patients in an out-patient psychiatric clinic. They found, as did Marcus (1977), that the families of autistic children reported the most overall stress. The reason may be related to the ambiguity of the autistic child, that is, not appearing to be handicapped, or may be due to the autistic child's having a greater potential for generating increased care-giving problems (Bristol & Schopler, 1984). Bristol (1979) and Beckman-Bell (1980) have each suggested that the care demands made by the child, regardless of handicap, may be a central cause of greater or lesser stress on the family. Regardless of child characteristics, the preexisting family characteristics may heighten the negative impact of the child. Gath (1977) proposed that the presence of a handicapped child did not appear to bother marriages that were reasonably stable, but did magnify preexisting weaknesses, turning stress into rifts.

Kazak and Marvin (1984) compared 56 families with a child who had a diagnosis of spina bifida with a group of 53 families without a handicapped child but with a child the same age as the handicapped child. Children with spina bifida in many cases must use braces, canes, or wheelchairs and require special bowel and bladder procedures, but may be normal in intellectual ability. The results of the comparison suggested that the families with the handicapped child are under more individual stress but not more marital stress. The strain in the family was directly related to parenting issues rather than the relationship of the mother and father themselves. The mothers, however, appeared to be more stressed than fathers in the family situation with the handicapped child, a finding also indicated in the study of successful parenting of handicapped children by Gallagher, Cross, and Scharfman (1981).

Some studies reveal increased marital tension (Marcus, 1977; Tavormina & Kralj, 1975) while others suggest no difference (Freeston, 1971) and a few indicate an increased parental closeness relating to the presence of the handicapped child (McAndrew, 1976). The separation and divorce rate in families of young handicapped children appears to be significantly higher than in comparable families with a young nonhandicapped child (Bristol, Schopler, & McConnaughey, 1984).

Another source of potential family stress lies in the siblings of the handicapped child. A number of investigators have found increased school maladjustment in the siblings (Tew & Laurence, 1973) and

increased domestic responsibility for them, especially for older female siblings (Gath, 1977). Even so, other studies (Cleveland & Miller, 1977; Simeonsson & McHale, 1981) found a majority of siblings reported good relationships with a retarded sibling. Vadasy, Fewell, Meyer, and Schell (1984), in their literature review on siblings of handicapped children, were impressed by the complexity of the relationships found between handicapped children and their brothers and sisters.

Does the age of the child with handicaps or the stage of family development make a difference in stress? Both Farber (1959) and Bristol (1979) found older handicapped children to be more stressful than younger children. Blacher (1984) reviewed the data for sequential stages of parental adjustment and concluded that the evidence is not yet convincing for an inevitable grieving process, and that it might be better to view the actual personal and social dynamics that are present in the family and the social environment than to assume the presence of grief.

Turnbull and Blacher-Dixon (1980) found increasing stress for some parents in mainstreaming their preschool handicapped child. Such a move increased their concern for the social adjustment of their child and the possible stigma visited upon their child by other children and parents. If such a negative reaction to mainstreaming is expressed by the parents, it might be otherwise considered as a family reaction to school—a different stage in the family's evolution. These parents are merely facing adverse societal reactions and stressful conditions at an earlier time in their child's life because of the earlier entrance of their handicapped child into a school with nonhandicapped children.

Family Resources and Coping Skills (B)

There has been recognition for a number of years that the presence of a handicapped child can cause great stress and turmoil in the family. The anecdotal reports by parents themselves have made that clear (Turnbull & Turnbull, 1978). During recent years; a somewhat different portrait has emerged from the literature. There is recognition that it is the *family resources and coping skills*, factor (B) in Hill's (1958) model, which combines with the stressor (A) and perceptions of the situation (C) to produce the final family adaptation. Consequently, attention has shifted recently into investigations of the strengths of the family. Many families seem to cope very well with this event and do not show either a pathological response (Barsch, 1968) or a major shift in their family operation (Gallagher, Scharfman, & Bristol, 1984; Longo & Bond, 1984).

We will define *coping* as the problem solving efforts made by an individual when the demands of a given situation tax adaptive re-

sources. *Personal coping* refers to the efforts made by an individual acting as his or her own resource rather than seeking support assistance or validation from the social environment. *Social support* is defined as individuals, groups, or institutions that provide assistance of varying degrees in forms to help another individual combat stresses that tax his or her personal resources (Schilling, Gilchrist, & Schenke, 1984).

Hill and Hansen (1960) formulated four hypothetical propositions regarding family resources:

1. Adaptive behavior is more likely in families that are intact and well integrated than in families that are not.
2. Adaptive behavior is more likely in families in which channels of communication are open.
3. Adaptive behavior is more likely in families in which authority and status structures are flexible.
4. Adaptive behavior is more likely in families that have successfully met past disasters. (p. 113)

This list suggests that just as individuals have variable resources to bring to a stressful situation, so do families. One of the critical features affecting the family responses is its socio-economic status (Rabkin & Streuning, 1976; Rosenberg, 1977). These investigators have suggested that lower-class family members experience more severe, though not necessarily more frequent, stressful events than members of the middle class. Ramey, Mills, Campbell, and O'Brien (1975) have found that families in economically disadvantaged circumstances, particularly one-parent families, may be forced to expend so much of their energy just to maintain an intact household that there are few psychological or physical resources left to share with the individual children.

What is the relative strength of various support mechanisms to the family? Friedrich (1979) studied a variety of psychosocial and demographic variables in a search for the best predictor of effective coping behavior on the part of the mother. In a sample of 98 mothers with children who had a wide variety of handicapping conditions, the major finding was that the most significant contributing variables to effective coping were the mothers' feelings of marital satisfaction. It was much more important than the nature of the handicap of the children. The mothers also reported more stress with an institutionalized child and with a female child, but marital satisfaction was the overwhelming factor. Therefore, the relationship between the mother and the father becomes a highly significant factor in coping behavior. Support from the members of the immediate and extended family was also a significant predictor of successful adaptation in families of autistic and autistic-like children (Bristol & Schopler, 1984).

The Perception of the Individual (C)

One of the important questions for professionals working with the families of handicapped children is: What are the alterable variables in the situation that can improve the circumstances of the family? It is clear that, in most families with moderately to severely handicapped children, the basic handicap in the child is not essentially alterable, although special education and related services may reduce the caregiving demands which the child makes upon the family.

Another key area of possible modification and change lies in Hill's factor (C), *the perceptions of the parent*. The presence of social supports can help maintain a feeling of parental self-esteem and underlines the potential interaction of the factors in the ABCX model. Nuclear family members, close friends and relatives, and other significant people are often the most basic source of support (Schilling, Gilchrist, & Schenke, 1984). This is one dimension, personal perception, where the professional-parent relationship can be brought to bear to change perceptions in a positive direction. In the past this relationship has not often been helpful, and parents have frequently been blamed and criticized when they were too overwhelmed by other forces to carry out the suggestion of the professional; they were even held responsible for a particular program being ineffective (Gallagher, 1956). In such cases, parent-professional interaction becomes a source of additional stress rather than support (Turnbull & Turnbull, 1978).

By reviewing families who had been identified as successful adaptors, Gallagher, Cross, and Scharfman (1981) found that one difference between these "successful" families and "average" families with handicapped children was the increased strength and confidence shown by the mother in the "successful" families. There was also a suggestion that the supportive role played by the father was an important element and was an alterable variable. The father has often been ignored in "family treatment" programs that essentially turn out to be "mother treatment" programs. There is growing literature which suggests that fathers also suffer from depression and lowered self-esteem and react negatively to the social stigma and extra-familial pressures that emerge from the presence of a child with handicaps (Gallagher, Beckman, & Cross, 1983; Murphy, 1982).

Kazak and Marvin (1984) pursued the issue as to whether having a handicapped child changes the perceptions of the parents (C) and also the social network and social supports that the family might have (B). They found the social support networks of the parents of handicapped children were smaller than those of the comparison group. Families of the handicapped children had significantly more *dense networks*, that is, people in that social network were more likely to interact with one another. The families with handicapped children

had significantly greater *boundary density* than the comparison group, that is, the mothers and fathers of handicapped children had much greater overlapping network membership than was the case in comparison group families. Finally, they reported that many of the mothers in the study suffered from parental "burnout" and, as a result, often felt less competent as mothers.

By using the Hill model we are able to think about the separate elements of stressors, supports, and perceptions and find vehicles for intervening in the family in a constructive fashion.

Carolina Institute for Research on the Early Education for the Handicapped

The evidence for the complex interaction of factors in families with children with handicaps is impressive. Tracing the patterns of these interactions is a research challenge of substantial proportions, and, with the support of the Office of Special Education Programs, this is what we have taken on as a central task in the Carolina Institute for Research on the Early Education for the Handicapped.

In building a research program addressed to the issues of families, the Carolina Institute for Research on the Early Education for the Handicapped identified, from the literature, five major problems in families with moderately to severely handicapped children that would seem to increase the likelihood of a maladaptive response from the family and that, consequently, challenges the professional service community (Gallagher, 1983). These special problems were:

1. The child with a handicap often has a lessened ability to form reciprocal and mutual reinforcing transactions with parents.
2. The child with a handicap often shows greater dependency needs, which force the caretakers within the family to spend more time and effort coping with the child's needs.
3. There is the danger of lessening the mutually reinforcing social interaction with other adults and children within the extended family, friends, and neighbors.
4. The families must cope with the symbolic death of their aspirations and their hopes for a normal child.
5. Many varied family structures must cope with these problems.

Using these five points as a focal base for planning, three major programs of research have now been developed under the Carolina Institute for Research on the Early Education for the Handicapped. The first of these, called Fathers Present-Fathers Absent, is conducted by Marie Bristol, Eric Schopler, and the writer. The purpose of the Fathers Present-Fathers Absent project is to identify informal and

formal sources of support related to successful adaptation in families of young handicapped children. In a series of studies, the project is assessing the immediate and longer range contributions of paternal instrumental and expressive support to family adaptation and child progress in two-parent families and of alternative sources of support in single-parent families. Adaptation and support in families of young handicapped children are being compared with that in families of young nonhandicapped children. As a result of the studies in North Carolina, the investigations are being replicated at selected sites throughout the United States.

The second research program, Facilitating Parent-Child Reciprocity, is being conducted by Nancy Johnson-Martin, Barbara Goldman, Lynne Feagans, and Jean Gowen. In this study the investigators are looking at the parents' ability to identify subtle cues for their handicapped infants which suggest that they may be responsive to various stimuli. The investigators are using videotapes to illustrate the responsiveness of the infant to the parents and to help sensitize parents to the infant's abilities as well as to their disabilities. These investigators will look at changes in parental attitudes over time coincident with their increased perception of the responsive behavior of the child.

Finally, Rune Simeonsson and Don Bailey are evaluating the relative strength of various intervention factors and family variables in a statewide home visitation program for families with a preschool-aged child with handicaps. This study will result in a substantial multivariate analysis of the relevant contributions of family variables and treatment variables to the outcome of family adaptation.

The institute has had a commitment of support for 5 years, and we hope that we can have more to say about the relative influence of stressors, supports, and perceptions on the families of children with handicapping conditions at the end of that period.

In the past quarter of a century, we have come a long way in providing more intelligent and more effective support for families with handicapped children. The extensive research programs now in progress at the Frank Porter Graham Center at the University of North Carolina at Chapel Hill, as well as at many other universities in the country, give promise that in the near future professionals can be more effective in their interactions with families.

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CHAPTER 3

Families with Mentally Retarded Members: An Agenda for Research 1985–2000

Bernard Farber

Since midcentury, changes have taken place in American society that have had a profound impact on both the family and the lives of mentally retarded persons. In order to yield useful findings, future research on families with mentally retarded members will have to take these changes into account. This chapter suggests yet another perspective for future research in this area.

Studies of families with a mentally retarded member have generally treated each family as an isolated system (e.g., Farber, 1961; Turnbull, Summers & Brotherson, 1983; Zimmerman, 1979). Sometimes these investigations deal with the relationship between family and a particular external system—the neighborhood, medical personnel, schools, and so on. However, since World War II, there has grown an interrelated set of institutions and groups with a common interest in mental retardation. This mental retardation community consists of (a) the mentally retarded and their families; (b) medical, educational, legal, and social supporting professionals and their respective institutions; (c) the family's kith and kin as interested parties; (d) co-workers and employers, particularly in sheltered workshops; (e) university research and educational personnel; (f) advocacy and professional organized movements, and so on (e.g., Birenbaum, 1970; Rowitz, 1981;

Voysey, 1975). When a child is labeled as mentally retarded, the family becomes more or less incorporated into the mental retardation community. To some extent, there may be "an inevitable social regression that leaves [each] succeeding generation with a sense of having to start over" (Evans, 1983, p. 281). Yet, in the long run, such a community creates (and transmits) both interpretations of mental retardation and ways of dealing with the retarded. However, little systematic research has been undertaken on the role of the mental retardation community in the life of families with retarded members. This chapter proposes that such a program of research be developed in the coming decades.

BACKGROUND STATEMENT

Prior to the latter half of the 20th century, one could not speak literally to a mental retardation community. There were professionals who formed associations and special interest groups focusing on the mentally retarded population. Yet the families whose lives were often transformed by the presence of a retarded child tended to be isolated from one another. However, shortly after World War II, families with retarded children organized into parents groups, and government agencies undertook the development of educational, medical, and social programs dealing specifically with mental retardation. The dominant view was derived from this view of the family as an isolated unit: The presence of the child provokes a crisis in family relationships and, as a consequence, the family itself becomes somehow pathological. At a minimum, there is a drain on the time and resources available for home care (Moroney, 1983; Perlman & Giele, 1983). Particular emphasis in research was given to the issue of institutionalization as a way of counteracting the family crisis (Farber, 1959; Saenger, 1960).

With the increased interaction among families with retarded members, there has been a questioning of the traditional prevalent views regarding mental retardation. Rather, the dominant concern of families now is to participate collectively in promoting the welfare of their children and themselves. This participation involves the formation of a community—a set of interrelated institutions—which permits culture building. In social research, there has been a growing tendency to shift from concern with family problems generated to "negotiating" new social meanings—new ways of handling the predicaments deriving from mental retardation (e.g., Bogdan & Taylor, 1982; Edgerton, 1967; Edgerton & Bercovici, 1976; Farber & Royce, 1977).

A basic contention of this discussion is that, as the mental retardation community continues to develop in the coming decades, the destiny of the family members will depend increasingly upon how

they balance their relationship with the mental retardation community against their relationship with the rest of society. To investigate this balancing off, the discussion proposes that we view mental retardation as a kind of reified concept in opposition to another reification representing the conventional social order—primarily the concept of God. The reification of mental retardation as a disruptive force (as opposed to a benevolent God) suggests that the mental retardation community then be treated as analogous to a religious cult, which is itself a kind of community. This model will permit us to apply insights and hypotheses derived from the study of religion to research on families with a retarded offspring. (For example, see the application of this perspective to the study of "civil religions" by Bellah and Hammond (1980), where nations are reified). (See also Bellah, 1967.)

In conversations, people normally talk about abstract concepts like money or fate as though they take on a life of their own. People use these concepts as if they "cause" good or evil (for example, money is the root of all evil; Mammon is a false god). Although such reifications can be considered merely as figures of speech, one can interpret them in a different way. Just as Freud regarded humor or dreams as disguising "deeper" meanings, so might one suggest that the figurative application of reified concepts also expresses a subjective reality. People do attribute good or evil consequences to the concepts themselves.

As a figure of speech, mental retardation refers to an invisible force that "causes" a wide range of disruptive behaviors. Instead of denoting a class of stressful and deviant behaviors, mental retardation is proffered as the *reason* for their occurrence. For example, "You are retarded. That is why you can't do some things like school work" (Bogdan & Taylor, 1982, p. 174); or "They say, 'The kid is retarded.' [That's how they] make an excuse for [his inappropriate behavior]" (Bogdan & Taylor, 1982, p. 87). The research literature is replete with other examples.

The ideas that people have regarding mental retardation are enmeshed in a whole complex of implicit social theories they have about how the world works. These theories enable them to account for whatever happens to them. They are "theories-of-action" as distinguished from "espoused theories" (Argyris & Schon, 1974). As the determinants of all deliberate action, they are "vehicles of explanation, prediction, or control" and, as explanation, they proffer propositions that permit one to interpret events (Argyris & Schon, 1974, p. 5). Moreover, insofar as implicit social theories function to direct our action, they introduce a sense of order and certainty into our view of the world around us. That is, when we are certain about something, we cease having doubts about its character, and we take for granted

that this something is what it seems to be; we "have faith" in those forces implied in the propositions comprising our personal theory. Once having achieved certainty, we need not think about the assumptions made in our own social theory any longer (Wittgenstein, 1975). It is an implicit sociological principle that for the most part our personal theories about social life are of this taken-for-granted nature (Garfinkel, 1967; Schutz, 1967).

Past research has documented the "effects" of labeling a child as severely mentally retarded on the parents' implicit social theories (Booth, 1978; Farber, 1959, 1960a, 1960b). Until the diagnosis, parents may be wary or anxious. But only when a definitive diagnosis is made do the parents begin to doubt their previously implicit social theory—to question the adequacy of this theory to explain this tragic event. This occurs as the parents regard mental retardation as having a profound "impact" on their lives. Imputing causation to "mental retardation" tranforms it into a reified concept.

The application of the concept of implicit social theory to the study of the mental retardation community can perhaps be best understood in conjuction with Durkheim's (1915) notions about God in *Elementary Forms of Religious Life*. For Durkheim, the concept of "God" is a reification of the force of "society" itself on the destiny of a people. His view is that the concept of "God is only a figurative expression of the society" (Durkheim, 1915, p. 226). In any society, the attributes of God symbolize the way in which the institutions of that society—family, economy, politics, and so on—are integrated (Swanson, 1960, 1967). In a centralized society, such as American society, God is seen as representing a pervasive moral force for resolving conflict and contradictions between institutions, that is, for promoting the common good. The concept of God embodies the constructive elements that weld society into a cohesive whole—these are the "good" causal forces, fostering a benevolent social order. (See also Glock, 1973; Thomas, 1979.) The idea of God, in Durkheim's scheme, is thereby the organizing principle for what is described in this discussion as implicit social theory based on conventional assumptions about society.

Central to Durkheim's scheme is the fact that, in a centralized society, God (as a symbolic representation of conventional society) is conceptualized as all-powerful. Seen as capable of resolving internal contradictions, God is characterized as having the power to overwhelm the destructive forces in the society. However, other concepts—like mental retardation—are reified as forces that inhibit the attainment of the common good and threaten the power of the centralized God. These threatening forces may form the basis of counter-social-theories, and they are seen as destructive of the coherence of

society. These are evil causal forces, bent on destroying the benevolent social order.

To Durkheim, religion is the purest expression of the force of collective life as it impinges upon the individual. Religious concepts provide the basic assumptions according to which the principles of social causation are interpreted. These concepts define the way the individuals perceive the functioning of society. Yet, semantically, the Durkheim position equates faith in the ability of a social structure to promote the common welfare with faith in God. Given this equation, it is not necessary for people actually to believe in a God figure for us to apply a religious analogy to families with retarded children.

Faith in God (or the social order) by members of the society depends, in part, upon their view of whether this God is effective in performing its integrating function (that is, resolving internal contradictions). This view is affected by the vantage point of the members, by the extent to which they regard conventional society as providing for the common welfare. Often this perception is a projection of the extent to which their own needs are being attained. It is in this light that many parents of retarded offspring lose faith in conventional society—and thereby in conventional, implicit social theory.

Looking at mental retardation as a force in a counterimplicit social theory implies that there is a widespread tendency among parents and others to reify the concept of mental retardation as a disruptive force in their lives. As used in the context of family relationships, the term *mental retardation* has a connotation of immorality. It is seen as generating social consequences that are uncontrollable and disruptive—clearly a challenge to the benevolent forces of conventional society as embodied in the concept of God: To what extent does mental retardation operate to undercut the benevolent social structure?

The thesis of this discussion is that the extent of participation by parents in the mental retardation community is a function of their implicit social theory. Generally, in an unsystematic way, the parents conceive of various social forces as affecting their destiny. As part of this implicit theorizing, they tend to reify the presence of mental retardation as having a power over their lives, just as they reify the social institutions in conventional society (usually in terms of a concept of God) as having a power over them. This paper suggests that participation of parents in the mental retardation community is dependent upon how they balance their perceptions of the relative power of these two forces in affecting their life course. In other words, it is not merely the parents' perceptions of mental retardation (and its manifestations in the child) that define how they participate in the mental retardation community; it is also their perception of the larger society itself. The parents can (a) regard God (conventional society)

as superordinate, (b) regard God and mental retardation as equi-powerful and therefore in competition, or (c) regard mental retardation as a more powerful force in their lives. The resolution by the parents of this conflict can be described in terms of three basic scenarios in the morality drama for the parents to follow:

God As Superordinate

Parents who view God as superordinate tend to regard mental retardation as a force in the service of God. Overcoming possible deleterious effects of mental retardation is somehow tied to their salvation. They may see the birth and rearing of a retarded child as a test by God of their mettle—"a cross to bear," a trial of their worthiness, or "my greatest mission in life" (Farber, 1968, p. 157). Alternatively, the parents may regard mental retardation as a punitive agent of God—punishment for transgressions or for the mistreatment of others. In any event, mental retardation is interpreted as, in the final analysis, serving an integrating function rather than a destructive function in society.

Competition Between God and Mental Retardation

Other parents view mental retardation and God as independent forces engaged in a struggle for power over the lives of their family members. The competition for control over their lives is construed as a battle between good and evil, in which mental retardation represents a destructive way of life and God (or conventional society) represents a coherent approach. In any case, the outcome depends upon the parents' ability to develop an effective alternative way of life for their retarded offspring, one that will isolate the disruptive social effects of retardation.

God as Subordinate

Still other parents interpret mental retardation as having triumphed over the constructive forces of society. The presence of the retarded child has destroyed any faith in the orderliness of the universe: God is dead; destiny is a matter of chance. Nature is disordered, under the control of a malevolent force. Alternatives are sought to "contribute to the shaping of [a new] form of social organization" (Glock, 1973, p. 300). This view implies a motivation to construct new kinds of communal existence—ineffective though they may be—to cope with an open-ended universe.

Among the possible scenarios, there is a fourth, the Job syndrome: Despite the overwhelming destructive impact of the mentally retarded offspring on family relationships, the parents still maintain their faith in the benevolent power of God (the social order). The parents confess to a lack of understanding of the way "the system" works, but they accept its legitimacy. The Job syndrome putatively leads to a withdrawal from social participation. However, like the other scenarios, the Job syndrome evokes various questions for research: How is the family led to adopt the particular scenario? Which social and psychosocial factors are involved? Most important, what are the consequences of the choice of scenario with regard to the family's participation in the mental retardation community?

The following sections expand upon the typology of scenarios of family participation in the mental retardation community just given. Describing this participation in the vocabulary of religious cults, they discuss the different scenarios with regard to (a) cult activities or the kinds of things that families do in relation to other social institutions in the mental retardation community; (b) cult careers, or the process by which parents are incorporated into the mental retardation community; and (c) the utopian aims—the messianic age—envisioned by the members of the mental retardation community.

CULT ACTIVITIES

Vogt (1951) defines cult as "the system of religious actions which comprise public worship" (p. 154). In contemporary society, cults have come to mean groups "that espouse an alien belief system that deviates strongly from the traditional faiths with which most people have grown up" (Melton & Moore, 1982, p. 15). It is in such cults that new ways of life—new cultural forms—emerge. The concept of *cult* seems to offer a paradigm that permits a fuller understanding than now exists of how families use *mental retardation* in reworking their lives.

Although the term *cult* is often now used in a perjorative way, for Durkheim (1915) a *cult* represents the very means by which people establish a relationship to a deity (or, in his view, to the society itself). He proposes that "the cult is not simply a system of signs by which a faith is outwardly translated: It is a collection of the means by which this [faith] is created and recreated periodically" (p. 417). Even in secular settings, people with congenial implicit social theories come together to reinforce their common faith and, in doing so, participate in culture building—developing a way of life appropriate to their assumptions.

The power of the cult (or religious community), according to Vogt (1951) is derived in several ways. First, the ritual acts associated with

the cult are presumed to have "actual objective practical effects" (p. 161). Second, the ideology of the cult provides a means for appraising and rearranging all aspects of one's life, and, in doing so, it provides the individual with an inner sense of order. Third, "it is by and through the cult that religious ideas and moral ideals are given the popular force and currency" (p. 162). Finally, the cult has an emotional appeal, a sense of belonging and cohesion.

Unlike the ordinary cults, the mental retardation community finds its focus in actions that are intended to subdue a dreaded deity. The force of mental retardation is seen as capable of destroying the orderly flow of social existence if it is left unchallenged. The mission of the mental retardation community is to devise and/or use effective means to counteract the malevolent influence of retardation.

One would expect the kind of communal form followed by families to be related to their stance on the relative power of God (or conventional society) vis-a-vis mental retardation to intervene in their lives.

God As Superordinate

The Durkheimian view of God as being a symbolic representation of social order suggests that people who view God as a superior power regard society as orderly, manageable, and predictable. It presupposes that, in an essentially orderly society, forces of disorder (such as mental retardation) are effectively controlled. The problems that do emerge do not seriously threaten one's orderly existence—provided one fulfills the mission of caring for the child. Rather, in reality, these "problems" putatively motivate families to reinforce the order in their lives and their commitments to conventional social arrangements. Caring for the retarded child involves the ritual acts by all family members necessary to carry out the mission—(a) effective use of legal, medical, and educational services; (b) attentiveness as a family task; (c) mainstreaming whenever possible as a right of the retarded, and so on. Management of the retarded member becomes a focal point of family life; care takes on the proportions of a religious obligation—whether or not the symbolism of God is applied, the mission of family-management emerges.

God and Mental Retardation As Competitive

If God and mental retardation are given equal but opposing valences, the implication is that any attempt to integrate the retardation cult into mainstream institutions (the domain that God symbolizes) is risky. The ensuing conflict of forces might damage the social order irreparably. Instead, the mission of parallel structures sees compartmentalization as an appropriate solution. Such a solution would in-

volve a duplication of mainstream institutions to accommodate the retarded, for example, special classes in school; special social services (including volunteer advocates): special athletic competitions (such as the Special Olympics); special domestic arrangements (like fostering and halfway houses; and special workshop and recreational programs. Even parallel communities have been proposed that permit the retarded to carry on an essentially normal existence, but with certain legal and social protections (Dexter, 1962). The intention of the parallelism mission is to effect "normalization" using different standards from those applied to other persons. In families, persons dedicated to the mission of parallelism would attempt to separate the lives of their normal and retarded offspring. For example, Grossman (1972) found that parents of university students tended to isolate them from their retarded siblings so that the normal and retarded siblings led parallel family lives. By way of contrast, less affluent parents of community college students seem to have encouraged interaction between them. In general, the mission of parallelism involves the compartmentalization of potentially conflicting social order. However, opponents seem to consider parallelism as a form of "colonization" (cf. Bercovici, 1983).

Subordination of God

If one regards mental retardation as having a determining influence upon his or her family's destiny, attempts to counteract this influence may be seen as beyond the reach of the individual family. Dreading the effects of retardation may evoke participation in such support systems as parent groups or extended family ties. Enlarging the store of resources would provide the means for counteracting the destructive force of retardation. The mission of communal action would aim at overcoming what these parents see as the inability of organized agencies to meet the challenges of mental retardation. In their eyes, social order is capricious and illusory and, hence, not to be trusted. As a result, some parents devote themselves fully to counteracting the malevolent effects of mental retardation—both at home and among other parents—sometimes to the detriment of successful work patterns, satisfactory family life, or recreation. For such parents, communal action is necessary to foment development of cultural forms that can effectively counteract the malevolent forces of mental retardation.

Residual Group

There is likely a fourth group of parents, one that sees neither God nor mental retardation as influencing their lives. Denying the exis-

tence (or at least the power) of either force, these parents are in an anomic state—isolated from the norms of either the conventional or the mental retardation community. To maintain this position, the parents withdraw as much as possible from the conventional social structures as well as from those established by the mental retardation cult. Hypothetically, the parents are regarded by all around them as deluded, "strange," isolated, or mentally ill. As a residual class, the actions of these parents are presumably idiosyncratic.

Do parents specialize in kinds of missions to alleviate effects of mental retardation? The designation of family-management, parallelist, and communalist missions suggests that parents specialize in the kinds of action they take to meet the challenges of mental retardation. Do the parents with different missions interact with each other (and with outsiders) in different ways—that is, can an observer discern the scenario of the group from the topics that the parents discuss, their demeanor in interaction, their stances toward policy makers, and their modes of organization? To what extent do parents interact with people dedicated to other missions and from other special interest groups? If they do interact, what is the optimal mix for advancing advocacy policies? How do members with different missions relate to professionals involved in the mental retardation community? What role do they play in the politics of the mental retardation community and in the larger society?

CULT CAREERS

If one regards the mental retardation community as analogous in some ways to religious cults, one must consider not only the impact of the diagnosis on the parents, but also the incorporation of the parents and siblings into the community of groups and social institutions associated with retardation. It is in this community that culture-building takes place to meet the challenges of mental retardation.

In their discussion of "the cult experience," Melton and Moore (1982) note that entering a cult "usually occurs during or after the severe buffeting of early adult transition," (p. 47) and, following Turner (1977), they view such transition states as playing "creative roles in society, enabling renewal and needed changes" (p. 49). The diagnosis of mental retardation places the parents in a comparable transition state.

Faced with the diagnosis of retardation, parents find that their various statuses in society have little bearing on their new situation. Instead, they see themselves as being in an unstructured state in which the future is uncertain (Booth, 1978). The parents are "neither here nor there; they are betwixt and between the positions assigned and arrayed by law, custom, convention, ceremonial" (Turner, 1977,

p. 95). In this state, they are vulnerable to the influence of implicit social theories associated with the mental retardation community and are open to initiation into groups with special missions. Putatively, the groups that the parents choose are tied to the kinds of significant others whom they select as they enter the mental retardation community.

God Superordinate

From a Durkheimian perspective, the parents in this category are seen as closely bound to the conventional social structure. Consequently, these parents would likely seek out significant others who would represent this structure—physicians and auxiliary medical personnel, biological research personnel, administrators of hospitals and educational institutions, religious functionaries (i.e., priests, ministers, rabbis), and so on. The significant others chosen would be persons who are identified primarily by their position in the conventional social structure rather than by their status in the mental retardation community. The choice of such persons as significant others would permit these parents to select the perspectives and norms that would integrate their mental retardation mission into the larger complex of social institutions—religion, science, national policy, and so on.

The Competitive Position

Earlier, it was suggested that parents who regard the power of mental retardation as competitive with that of God in affecting their lives also seek to promote a parallel life style for retarded persons. If such is the case, one would expect that initially these parents see themselves as most compatible with other members of the mental retardation community who are faced by a similar dilemma—the competition between God and mental retardation. Putatively, those persons selected as significant others would be proponents of parallel life styles for the retarded—advocates of halfway houses, alternative residential arrangements, sheltered-workshop professionals, advocates of "humanistic" approaches, educators in special education, and so on.

God Subordinate

Persons seeing the impact of mental retardation on their lives as overwhelming the effects of conventional structure appear to seek out yet a different kind of significant other. Parents in this category would tend to oppose conventional efforts to combat the effects of mental retardation. Rather they would select as significant others those people who themselves find the conventional structure incap-

able of dealing effectively with mental retardation—parent-involvement advocates, kith and kin on the periphery of the mental retardation community, proponents of unorthodox procedures, gurus and other mystics, and so on. In contrast to other subcults, members of the communal approach would be particularly apt to choose a charismatic leader opposed to conventional ways of facing the many challenges of raising a mentally retarded offspring (cf. Glock & Bellah, 1976; passim).

This section has suggested that participation in the community of mental retardation, at least putatively, is related to the kind of significant others that the parents and siblings select. Investigation of patterns of participation might then reveal the extent of crossing over from one subcult identity to another—family-management, parallelist, or communal subgroups—both over time as well as through simultaneous "membership." The effects of participation patterns on the personal lives of the family members could then also be determined. For example, it might be fruitful to investigate how these patterns are related to stress, style of life, and life course variables—including age-specific death rates of parents. But perhaps most important, research should be undertaken of the culture-building functions of these different subgroups—the new norms and perspectives they yield—particularly in the area of the family.

THE MESSIANIC AGE

The ultimate mission of the mental retardation community is the extinction of mental retardation itself. Like members of religious cults, the parents await the coming of a messiah—either an individual or a group—who will bring to bear scientific achievements, medical advances, social scientific insights, resources, and leadership needed to eliminate the numerous social and biological conditions of mental retardation. In the messianic age, mental retardation will be no more. (For a more pessimistic view, see Farber and Royce, 1977). But even so, parents and siblings dedicated to different missions may have different perceptions of life in the messianic age.

Presumably, parents with a family-management mission would focus upon the measures taken to prevent the occurrence of mental retardation. They may visualize a messianic period as one in which (a) the state of genetic engineering would have progressed to the point where, by splicing and careful selection, the probability of producing a mentally retarded child might be less than one in a million; (b) postpartum accidents could be repaired either chemically or by autosomal splicing; (c) faulty socialization would be treated by (as yet undiscovered) techniques of behavior modification; and (d) preventive

social measures would be instituted. For these parents, such an era would bear witness to the scientist—social, behavioral, and biological—as messiah.

Parents with other missions may anticipate problems even in the messianic age. For instance, they may believe that having children may be licensed by a National Institute on Family Planning. The policy may be that having children should not be left to chance: Why risk having a child with serious genetic defect or vulnerable to the kinds of illness that might lead to mental retardation? Instead, it might even be considered "indecent" to bear children "the natural way" rather than "the artificial way" by rational construction—by host mothering of implanted fertilized eggs.

Perhaps parents with a parallelist mission would be particularly concerned about what might happen to the persons who have been rescued from mental retardation: What special treatments might be required, for example, for the person who might otherwise have had Down's syndrome? The biological or social preventive "correctment" might itself be considered a special treatment. The parallelist parents might be concerned with the ethical questions (as well as psychological ones) pertaining to the possibility that "corrected" persons may feel that special demands (or obligations) have been placed upon them to repay the family and society for their "correctment." Would the "corrected" people feel intrinsically inferior—that they are *really* mentally retarded? Putatively, these may be the concerns of the parallelist cult: In the messianic age, would mental retardation be really and irrevocably extinct?

Parents with a communal mission may approach the messianic age in yet another way. Their view may be described by applying a Freudian interpretation to the elimination of mental retardation. Evil as it may be, mental retardation is the product of the "natural processes" of birth and socialization. Interference with these processes may generate a serious transgression against "nature" (or God). Whatever else befalls the parents afterwards can be blamed upon this sin: The unforeseen tragedies following interference with "nature" may impose a strong sense of guilt on the parents. The efforts at atonement may have significant effects on the family.

Although the discussion in this section has referred to the messianic age of mental retardation, the kinds of concerns described can be investigated now.

CONCLUSION

This discussion has proposed a cultural approach to research on families with retarded offspring in the coming decades. To summarize,

it has applied the concept of implicit social theory as a basis for action by families with retarded children. Using a religious analogy, based on Durkheim, for families with retarded members, it proposes that the role of mental retardation in family relationships depends to some extent on the relative power that parents impute to it as compared with conventional society. The discussion of putative modes of pa-

TABLE 1

Putative Modes of Familial Participation in Mental Retardation Community

Aspects of Community Life	*Societal Forces (God) Dominant over Mental Retardation*	*Societal Forces and Influence of Mental Retardation Competitive*	*Mental Retardation Dominant over Societal Forces*
Community activities: Mission of parents	Effective family management as focus of parental mission	Establishment of parallel institutions as focus of parental mission: Duplication of mainstream institutions	Communal action as focus of parental mission: advocacy, political action, parent associations
Incorporation into mental retardation community: Significant others	Significant others who are representative of conventional social structure: e.g., professionals in medicine, research, and administration—marked by their high status in conventional community rather than in the MR community	Significant others who are involved in parallel life style for retarded persons: e.g., professionals/advocates of special education, sheltered workshops, halfway houses	Significant others who oppose the conventional ways of dealing with the mentally retarded: e.g., proponents of unorthodox procedures, advocates of shifts in the politics of MR
The future: Prospects of a messianic age	Scientific goals met: Preventive biological and social measures in effect	Concern with coercive social control measures that may be needed to prevent MR and to monitor life of "corrected" persons	Concern with effects of interfering with "natural" processes: Unforseen tragedies deriving from thwarting nature

rental participation in the mental retardation community is summarized in Table 1.

The discussion does not presume that parents actually espouse the theory that mental retardation is a malevolent force; rather, its viewpoint is that parents act and speak as if it were one. An important question is whether, in the face of mental retardation, God (or the force of conventional society) is seen as playing (a) a superordinate role, (b) a competitive role, or (c) a subordinate role in the lives of the parents, siblings, and the retarded persons themselves. This discussion has suggested that the parents see this interplay as alternatives in a morality drama, with either (a) good (conventional social structure) as reality and evil (mental retardation) as illusory (by actually serving to strengthen conventional social structure), (b) the isolation of the evil (mental retardation) from the good (conventional society), or (c) the subjugation of the good (conventional way of life) by the evil (mental retardation).

For the most part, the emergence of new cultural forms is being neglected in research on the mental retardation community. Yet, if a coherent effort is to be developed to meet the challenge of mental retardation, perhaps better ways are needed to coordinate the numerous elements in the mental retardation community. Toward this end, research based on the cultural approach will be valuable.

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CHAPTER 4

Future Directions in Early Childhood Education for Exceptional Children

Merle B. Karnes

HISTORICAL PERSPECTIVE

Most progress in the field of early childhood handicapped has taken place since the late 1960's. Already in the 1920's, however, a few special educators were committed to the importance of the early years. Their concentration on research involving intervention with young handicapped children laid the foundation for what has followed.

The nursery schools that developed in this country during the 1920's were influenced by Maria Montessori (1912) in Italy and by Margaret McMillan in Britain (1919). John Dewey's (1899) "learning by doing" was being promoted and was compatible with the curriculum of Montessori and McMillan. Early childhood was being stressed by Freud (1922) and by Gesell (1929). The influence of Piaget (1926) was likewise to focus attention on early education as a time when special learning occurs.

During the same period, nursery schools were being established in departments of education and of home economics. Some of these are still in existence. In some institutions, child study institutes emerged to serve as laboratories for teacher training and to provide subjects for research. Such schools offered opportunities for children to develop in an informal or open setting. The main goal was socialization—perhaps because most of the children belonged to faculty,

students, or to other middle- and upper-class parents in the community. Since the children's development was fostered at home, the nursery school was supposed to help them become more adept at interacting with peers. This was the approach to early childhood programming often referred to as the traditional approach.

As would be expected, young handicapped children were not usually accepted in nursery schools. The alternative was to place them in institutions or to keep them at home without the benefit of an organized program.

The pioneer work conducted by Skeels and his associates at the University of Iowa in the early 1920's represents one of the few early education programs set up for research. Skeels and Dye (1939) provided 13 children under age 3 whose average IQ was 64 with one-to-one stimulation from older, institutionalized mentally retarded individuals. In addition, the infants received stimulation from attendants, who also provided them with toys. These researchers identified a comparison group of infants (IQ 87.6) who remained in an orphanage without intensive stimulation. After 1½ years, the 13 experimental infants showed an average IQ gain of 27.5 points, while the comparison group showed an average loss of 26 points. Twenty-one years later Skeels (1966) followed up both groups and found that all 13 experimental subjects were self-supporting. None were in institutions for the mentally retarded. All were functioning in the middle class. Of the 12 individuals in the comparison group, 4 were in institutions and 7 were working at low-level jobs; the 12th was deceased. Generally, the comparison group manifested poor social adjustment, frequent unemployment, and mental illness. The median grade attainment of the experimental subjects was 12th grade, while the median grade attainment of the comparison group was less than 3rd grade. Skeels received little recognition for his early work at the time he conducted the study. In fact, his results probably produced more skepticism than anything else. Years later, however, the Kennedy Foundation honored Skeels for his pioneer research. One of his experimental subjects, a young man who was then taking a master's degree at the University of Minnesota, participated in the presentation.

In a research project carried out in the Milwaukee Public Schools, Kirk and Stevens (1943) developed a preacademic curriculum for 6- and 7-year-olds diagnosed as mentally retarded. The curriculum was more specific than Skeels', and a certified teacher worked with the children, whereas, Skeels' teachers were older retarded youth who were themselves institutionalized. Kirk found that the behavior of children provided with the preacademic curriculum changed markedly. They became more interested in school, were generally happier, maintained longer attention spans, demonstrated more positive at-

titudes toward learning, worked more cooperatively with other children, and had fewer behavior problems. Kirk accounted for this positive attitude by associating it primarily with curricular offerings that made success possible. When children experienced success, they liked school better and were more motivated.

In 1948 Kirk obtained financial support from the National Institute of Mental Health and from the State of Illinois Office of Public Instruction, Special Education Division, to initiate a 5-year research program with young mentally retarded children ages 3 to 6. This was the first federal grant received by the College of Education at the University of Illinois and was the only grant given to an educator by the National Institute of Mental Health (NIMH) in 1948.

A house-to-house canvass was made in various sections of Champaign-Urbana to identify children. These parts of the community were made up primarily of low-income families. Social agencies served as sources of referrals to the project, as did the Public Health Department. In addition, the public schools were contacted for names of younger siblings of children who were in classes for the educable mentally retarded. All children referred were examined by an interdisciplinary team.

After establishing an experimental and a contrast group of handicapped children in a community setting, as well as experimental and contrast groups in institutions for mentally retarded, Kirk (1958) sought answers to three questions:

1. Does preschool training of mentally retarded children affect their rate of development?
2. Does the preschool rate of growth continue?
3. Are the results similar for children living in different environments—at home, in foster homes, or in institutions?

The program covered the full day, from 8:30 in the morning to 3:00 in the afternoon, and was concerned with cognitive and language development, as well as social and emotional development and the physical well-being of each child. The instructional program was partially an open framework modeled after a traditional preschool but with parts of the day structured and teacher-directed. In other words, blocks of time were given to free play and free choice of activities, and other blocks were teacher-directed, focusing on areas of development where it was evident from tests and observation that the children were lagging. The teacher-child ratio was 1:4 to ensure individualization of instruction. On the staff were a speech correctionist, a medical doctor, a psychologist, and teachers. There was also a close working relationship with the Public Health Department and various social agencies. Regular case conferences were held where long-range

goals for the children were set and short-term objectives were delineated. Daily anecdotal records were kept. Pre-, interim, and post-data were collected yearly.

In general, Kirk's finding reinforced those of Skeels: 70% of his experimental subjects demonstrated acceleration on measures of intellectual development and social maturity and retained those gains over time, while the contrast subjects fell off in rate of growth as indicated by follow-up testing. Kirk compared 12 of the experimental group with siblings who had not been enrolled in a preschool, in a few cases with twins who were not provided with a preschool program. He also compared preschool children enrolled in the experimental program with other experimental children who were moved to foster homes. Since the experimental children made greater progress than the contrast children, and since the experimental children who were moved to foster homes made greater progress than any of the other groups, Kirk concluded that the greater the change in the child's environment, the greater the acceleration of the child's growth. He further concluded that the total impact of home and school are critical for optimizing the development of the preschool child.

During this time Kirk, Karnes, and Kirk wrote *You and Your Retarded Child* (1955, 1968), which was used to enhance parents' understanding of their child and of appropriate programming for them. Parents were encouraged to visit the school and observe their child's program. A lending library was made available to the parents. In *Early Education of the Mentally Retarded*, published in 1958, Kirk made a plea for more formative evaluation of programs and the kind of investigation that would determine why some children are "winners" and some children are "losers" in even a good program.

Kirk was quite farsighted in his programming for the children. Although staff did not label the education plan developed for each child an individualized educational program (IEP), they were in effect writing IEPs. From test results it was determined where each child stood developmentally, and a curriculum compatible with the child's stage of development was provided—what Hunt (1961) some years later referred to as "the match" (p. 361).

In the 1958 book reporting this study, Kirk discussed the need for ongoing assessment, by means of frequent interdisciplinary staffings, to assist educators in making appropriate decisions about the child's curriculum. He was distressed that the available instruments to determine language development were largely restricted to vocabulary. It was during this early study that he grew convinced of the need for an instrument to pinpoint facets of language development so that teachers would have more help in developing appropriate individualized curricula. Thus the late 1940's saw work begun which led to the Illinois Test of Psycholinguistic Abilities.

There were very few programs for the young handicapped child during the time of Kirk's pioneer work. In California there was the Tracy Clinic for the Deaf, and in Chicago, Miriam Norris was conducting a study with blind children. As put by Jane DeWeerd (1981), a key figure at the federal level in promoting early childhood programs for the handicapped, "In the early 1950's, a visitor sent by a distant foreign government or agency to observe a sample of representative early education services for young children would probably have planned a time of perhaps a week or two" (p. 15).

In 1962 Kirk received the first Kennedy Foundation award primarily in recognition of his research on the early education of the mentally retarded. Sargent and Eunice Shriver were very interested in Kirk's research with handicapped children, and when Sargent Shriver became Director of the War on Poverty he initiated the Head Start project.

The first Head Start—a crash program—began in the summer of 1965 and represents the most massive national attempt thus far to educate preschool children. More than a half million (561,000) children were enrolled in this summer program. The program has increased from a Congressional appropriation for the summer program in 1965 of $96.4 million to $995.75 million in 1984. A total of 9,133,000 children have been served by Head Start since its inception. It is serving approximately one out of five of the eligible low-income children. Twelve percent of the Head Start enrollment consists of handicapped children (Administration for Children, Youth, and Families, 1984). Despite some negative reports on lasting effects of child progress (Westinghouse, 1969), the program has survived over 19 years. Funding fell off during the late 1960's and during the 1970's but has recovered recently. An interim report of the Consortium for Longitudinal Studies (1983), funded largely by the Administration for Children, Youth, and Families from 1975 through 1981, was responsible for accelerating Head Start funding by some $160 million.

Under the leadership of Irving Lazar, Special Investigator and Professor at Cornell University, in 1975 the consortium coordinated the efforts of 12 research groups who had conducted experimental programs for young low-income children, mostly in the early or middle 1960's. The goal was to determine the long-term effectiveness of early education on low-income children. By that time, many children in experimental preschool projects had become adults.

Members of the consortium—E. Kuno Beller, Richard B. Darlington, Martin and Cynthia Deutsch, Ira J. Gordon, Susan W. Gray, R. Emile Jester, Merle B. Karnes, Irving Lazar, Phyllis Levenstein, Louise B. Miller, Francis H. Palmer, David Weikart, Myron Woolman, and Edward Ziegler—agreed (a) to send their original raw data to an in-

dependent group in Ithaca, New York, for recording, formating, and independent analysis; (b) to cooperate on a common protocol for collecting follow-up data from their original experimental and control subjects; and (c) to seek out their subjects, collect the data, and send them to Ithaca for analysis.

As the Twig is Bent, (published 1983) is the result of this work. Each group of researchers contributed a chapter. One chapter was devoted to pooled analyses of consortium data, and a chapter written by Irving Lazar, the Special Investigator, dealt with implications of the findings. Lazar (1983) summarized consortium findings thus:

1. Preschool programs increase individual scores on standard intelligence tests, and these increases remain statistically significant for a 3- to 4-year period after the preschool experience.
2. During most of the elementary school years, arithmetic and reading achievement scores of program graduates are higher than those of controls.
3. Preschool graduates are less likely to be placed in special education or remedial classes than are their controls; they are more likely to meet the ordinary requirements of the schools and to graduate from high school.
4. Preschool graduates have higher self-esteem and value achievement more than their controls. Their parents have higher occupational aspirations for them than do the control parents—or the children themselves. The program graduates have higher occupational aspirations and expectations than do their controls, and these are predictive of their actual attainments.
5. Indirectly, the preschool experience increased labor market participation in late adolescence and the early adult years. (pp. 461–462)

Lazar (1983) draws the implications that "a well-designed and well-run program for very young children pays off in later effects—and indeed appears to pay for itself in the savings which accrue from the reduction of costs for special education classes" and that "closer contact between home and school and greater involvement of parents in the education of their children are probably more important than educational administrators had generally realized" (p. 464).

In the past many of us have been looking for the one best curriculum. But according to Lazar (1983), "the search for the 'perfect' curriculum is probably futile. What is important is that there is a curriculum with specific goals and a real assurance that the teachers are carrying out the curriculum. All the widely used curricula are represented in these studies, and all of them are effective, as far as these outcomes are concerned" (p. 464).

The consortium report has offset earlier, negative results on the effectiveness of Head Start and emphatically established the worth

of a high-quality program for at-risk children from low-income homes. We have learned a great deal from Head Start. We know that paraprofessionals can work effectively with young children, especially if there is ongoing inservice training. We have learned that parents want to become involved in their child's education program and that parent involvement does make a difference. We have learned that Head Start personnel can be precise in their planning for children and can individualize instruction. Research on Head Start eligible children substantiates our belief that an exemplary preschool program does prepare these children to cope with school expectations in subsequent years.

In 1968 the Handicapped Children's Early Education Assistance Act, P.L. 90-538, was enacted under the administration of the Bureau of Education for the Handicapped (BEH), now called the Office of Special Education Programs (OSEP). The first year was spent developing strategies for implementing the act, which was funded at $1 billion. In 1969, 24 projects were funded for a 3-year period to develop and demonstrate viable models. The goal of these demonstration projects has been to promote a comprehensive service delivery system to meet the special needs of children with handicaps from infancy through the age of 8. Projects are expected to develop and implement specific, innovative procedures, as well as products that are worthy of dissemination and replication.

Funding for the Handicapped Children's Early Education Program (HCEEP) grew to $22 million in the late 1970's, then declined to $17.5 million. Currently it stands at $21.1 million, and in 1985–1986 it is expected to be slightly higher.

Every state has received funds for at least one demonstration grant, and some for 10 or more. Over 400 demonstration projects have been funded to date. The first of these demonstration models focused on children from ages 3 to 5. In later years there was encouragement to develop model programs for handicapped infants. An interest also emerged in the middle 1970's in developing models for handicapped children who are gifted or talented.

The plan has always been that sites are given 3 years to develop their models, replication packages, and strategies for dissemination. No demonstration project has been funded longer than 3 years. At the end of Year 3, project directors have been expected to find funding for continuation of the model program. Projects who have demonstrated outstanding potential for replication have been funded for additional years as Outreach projects charged with helping sites replicate the models. Some Outreach projects have been funded for 16 years—3 for development and 13 for Outreach. A few have even been transported to other countries—England, Spain, Israel, Egypt, Peru,

Australia—at foreign expense. Some 150 different Outreach proposals have been funded since 1972. Currently 24 are being funded. Twenty-two Outreach projects have been approved for dissemination by the Joint Dissemination Review Panel of the Department of Education for national dissemination.

OSEP funded Roy Littlejohn to study the impact of 280 projects that have completed their 3 years of demonstration funding and are in Outreach. The first group was funded in 1969. Among the findings of this study were:

1. Eighty percent of demonstration projects were continuing to serve handicapped children.
2. A total of 2,157 replication sites serving 107,000 were identified; 1,991 sites were the results of Outreach activities.
3. For every HCEEP expanded in programming, $18.37 has been generated in programming for children and their families. Of this, $16.04 was generated through replication of models. Continuation of demonstration sites constitutes the other 2%.
4. More than 2,000 products have been generated by HCEEP projects.
5. Twenty-two projects have been approved by the Joint Dissemination Review Panel of the Federal Government, which gives the stamp of approval for national dissemination.

Because it was evident that research on various facets of early education of the handicapped was badly needed, four research institutes were funded by BEH for a 5-year period (1977–1982) to pursue critical questions about early education of the handicapped—one at the University of California at Los Angeles, another at the University of North Carolina, the third at the Educational Testing Service in Princeton, and the fourth at the University of Kansas.

This year, two initiatives go into effect as part of the early childhood handicapped program of OSEP. One is that states receiving incentive grant money can spend it for handicapped children down to birth. The second is the new States Grant Program written into the Early Childhood Assistance Act, Section 723 of P.L. 198–199. Any state or territory wishing to develop a comprehensive plan for handicapped children from birth through 5 can apply. The grants are not competitive. If a proposal is good, it will be funded. The grants do not have to go to a state educational agency; however, any agency that gets the grant has to collaborate with other state agencies.

Federal leadership in promoting identification and programming for young handicapped children and in seeking answers to critical problems has made a considerable contribution to progress in the field.

FUTURE DIRECTIONS OF EARLY CHILDHOOD HANDICAPPED

To make sure all young handicapped children and their families are provided the quality of services they need in years to come, we must direct our efforts to:

1. Conducting more rigorous research on the efficacy of early childhood handicapped programming.
2. Promoting legislation in every state to mandate identification and programming for handicapped children down to birth.
3. Providing high-quality undergraduate and graduate training in this specialized field.
4. Promoting high-quality day care programs that admit handicapped children.
5. Developing reliable instruments for screening young handicapped children from zero to 8 and assessing critical aspects of their development.
6. Working more effectively with families.
7. Developing more sophisticated ways of evaluating programs.
8. Developing more effective means of collaboration among agencies.
9. Encouraging women to go into politics.
10. Providing funds to conduct research.

Efficacy Studies

In 1980 BEH called for papers on projects that had gathered data to determine their long-term effects. Fifty-six reports were submitted. After critical review by a team of researchers, it was concluded that only nine were sufficiently rigorous to be accepted for publication. These appeared in the *Journal of the Division for Early Childhood* in December 1981. Considering the financial resources provided by the federal government to develop and disseminate models, it is discouraging that so little efficacy data are available to verify the worth of early intervention. Strain (1984) predicts that "those of us involved in early intervention for handicapped children will increasingly be competing against road builders, defense contractors, and waste management specialists in a struggle for program survival. As we enter this competitive bidding marketplace, we will be increasingly managed, manipulated, nursed, weaned, and occasionally destroyed by legal and legislative authority. . . . My personal opinion is that we will not fare well in the impending struggle unless we can show convincingly that intervention has a significant and enduring impact" (p. 4).

A follow-up on children in an intervention program should be built into the research design. Too often follow-up is tacked on after the treatment has been terminated several years. Problems in locating children can constitute an overwhelming problem, and attrition can bias the sample. David Weikart, on the other hand, who incorporated follow-up in his original plan and has kept up with the individuals in his research project each year, has held attrition down to a minimum (Schweinhart & Weikart, 1983).

It is too much to expect that a year or two of intervention during childhood will erase all problems associated with a handicap and carry a child through school with no need for further intervention. But often what happens to a child after leaving an early childhood program is not well documented. If there is a follow-up 5 years later, can success or failure be attributed to the early childhood treatment program? We must be more precise about the original treatment program and about treatment and/or supportive services provided or not provided to the child and family after leaving the program.

All of us would readily agree that encouraging the development of communication skills should be a major goal of any program for handicapped children, yet in documenting what occurs in classes of handicapped children taught by master's level teachers, Karnes, Johnson, Cohen, and Shwedel (1985) have found that the teachers do most of the talking and do not encourage the children to interact verbally with them, with aides, or with each other. Yet a written goal of the program places strong emphasis on language development, and if a follow-up were conducted, one would expect these children's scores in language to reflect that emphasis. When follow-up data seem to reveal a "wash out" of treatment, maybe the treatment was weak in the first place.

A common error in efficacy studies is to use either unreliable or inappropriate instruments to determine whether or not the goals of the program are accomplished. One goal often claimed as "major" is "self-concept," another is "persistence to task," and still another is "creativity" if the child is gifted/talented as well as handicapped, but reliability data on available instruments are too low to evoke confidence. Observational data may be more reliable than tests.

Swan (1981) states that there are at least six issues that must be considered in conducting efficacy studies.

> First, one must be precise in stating the research question. . . . Second, the treatment model, including the theoretical/conceptual base, must be precisely defined and the fidelity of the treatment must be assessed. Third, the measures to be used as indicator(s) of effectiveness must be determined. Fourth, the experimental design and the statistical analysis must be determined consistent with the question(s) being asked and

> the measures selected. Fifth, the time interval for considering the effectiveness of a treatment with a child (and his or her family) is critical. Finally, the communication of the results in a timely manner to the appropriate target audiences is absolutely essential to meet the purposes of the efficacy studies. (p. 2)

In his keynote speech to the Division for Early Childhood at the 1979 Conference of The Council for Exceptional Children, Lazar warned, "Don't count on sentiment to keep your programs supported. We must be able to show that early intervention for all children pays off in tangible ways" (p. 6). In discussing the need for research, he said, "Don't wait for the government to do it. Don't assume you need millions of dollars to make major evaluations. . . . In collaboration between practitioners and university scientists, you can do major work within your existing budgets. If you don't do it, mainstreaming will become the budget cutters' excuse for putting necessary special education out of business" (p. 7).

LEGISLATION

On April 5, 1984, the National Association of State Directors of Special Education circulated a list of mandated services for early education of the handicapped from 0 through age 6. At that time only six states had a mandate down to zero—Iowa, Maryland, Michigan, Nebraska, New Jersey, South Dakota. (Texas mandated services to zero for visually impaired, hearing impaired, or deaf-blind.) Approximately one-third of the states mandated services down to age 3. Obviously many state legislatures are not sufficiently committed to early education to pass legislation ensuring that young handicapped children are identified and served. It is therefore important that professionals and parents of handicapped obtain the training to advocate for these young handicapped children.

The federal government has provided the initial leadership for developing and demonstrating programs in the various states, but the current administration expects more and more leadership to come from the states. As indicated earlier, the States Grants Program written into the Early Childhood Assistance Act, Section 623 of Public Law 198–199, provides funds for states to provide this leadership. There are three types of grants: (a) planning grants for as long as 2 years; (b) development grants for as long as 3 years, within which the state will develop the plan and have it state-approved; and (c) implementation grants for as long as 3 years. Conceivably a state could receive 8 years of support. The law requires that the federal government provide technical assistance and fixes a minimum amount of money to be spent on this—30% of the appropriation for a given

year. During 1985–1986, for instance, the amount will be $6.3 million, 30% of the total $21.1 million.

UNIVERSITY/COLLEGE TRAINING

The number of universities and colleges training teachers to work in early childhood handicapped programs is insufficient at present, and if more states pass mandatory legislation there will be an acute shortage of professional staff in the 3- to 5-year-old range. Currently there are few programs training personnel to work with handicapped infants; most staff receive their training after employment.

To ensure quality, programs must be monitored, yet very few institutions are training supervisors and administrators of programs for young children. It is hoped that in the future more institutions will respond to this need. Research data to determine the value of supervision that promotes competency in staff and is reflected in child progress are badly needed. It is also hoped that states will begin to give fellowships or stipends to encourage outstanding teachers of the handicapped to pursue graduate work in supervision and administration of early childhood handicapped programs. States should be encouraged to require local school districts to employ supervisors, with systems sharing a supervisor when each has insufficient classes to warrant a full-time position.

Professionals at the doctoral level trained to conduct research or to provide training at the undergraduate and graduate levels are in demand, and the demand in the future is likely to surpass the supply if the States Grants Program accomplishes what it intends. Undergraduate and graduate training programs should have a closely supervised practicum that is competency based. This requirement applies not only to working with handicapped children but to working with parents as well. Family involvement is an area in which many special educators of young children are lacking. They feel inadequate to work with families and indeed do not have the competencies that make for confidence.

QUALITY DAY CARE

High-quality day care is needed for all children, but day care for handicapped children is virtually impossible to find. Parents of young handicapped children may be fortunate enough to have their child in a public school preschool if the legislation in their state is mandatory, but what if the mother works? Who will care for her child the other half day? Day care programs cannot afford to be responsible for handicapped children at the same costs as for a nonhandicapped child.

At one time when we talked of day care we automatically thought of mothers from low-income homes. Today women from all socio-economic levels are working and they need care for their children. But good day care facilities are nonexistent in some communities, and those that are available are often too expensive for even middle-class families. Cost ranges from $40 to $100 or more a week. If a parent, especially a single parent supporting two or three children under age 5, needs day care placement to enable her to work, more than half her salary may go to child care. If one of the children is handicapped, costs will be even higher. On the other hand, most day care workers get only minimum wages in centers and even less in private homes.

During the current administration, the federal government has reduced its interest in the day care problem. Title XX of the Social Security Act did provide the major source of federal funding for day care for the poor, but in 1981 this source of revenue was cut $700 million or 21%. Some funds specified for day care were cut out altogether. President Reagan claims to be assisting parents who need day care for their children by giving them tax breaks, but this is something of a distortion, because a large percentage of families who need day care have such low incomes that tax incentives are of no help to them.

Day care is such a national dilemma that the September 10, 1984, issue of *Newsweek* featured the problem. "The demand for child-care programs is soaring, but parents face serious questions about quality and cost" ("What Price," 1984, p. 14). According to this article, 5 million children have no one to supervise them when they go home, and 500,000 of these are under the age of 6. About 2 million children are enrolled in licensed day care, and approximately 5 million children are in nursery schools or kindergarten. These figures do not present the full picture, however, since not all children are accounted for. The number of two-job families has increased from 18.9 million in 1967 to 26.1 million in 1983. Among families with the spouse present, the number of working mothers of children under 6 has increased from .42 million in 1960 to 1.8 million in 1984. We can expect acceleration each year in all three categories.

In 1983 the U.S. Department of Health and Human Services reported 3,629,238 registered live births in the United States, 1% more than the births recorded in 1980. With advances in medicine, more and more handicapped infants are kept alive. According to *Newsweek*, a "baby boomlet" is predicted for the rest of this decade, and by 1990 the number of children under 10 will be 38 million, an increase of some 5 million ("What Price," 1984, p. 15). These data, coupled with the data on the number of working mothers, indicate an ever-increasing demand for day care.

Day care facilities are rarely available to parents with handicapped children, and yet these parents may have the greatest need since they are forced to work to defray extra expenses for rearing a handicapped child.

According to some researchers, children enrolled in quality day care programs are as well-off in important facets of development as those not placed in day care who remain at home. Some research findings even indicate that there are beneficial effects from attending day care.

What should be done to solve the ever-growing problem of quality day care? Should we follow Sweden's example and advocate nationalized day care? Soon after World War II, motivated by a shortage of industrial workers, Sweden developed a network of locally operated but state-funded day care centers and "family day nurseries" in private homes. Currently, approximately 6 out of every 10 Swedish women work. The Swedish government takes responsibility for all children age 3 months to 6 years. The cost of day care is estimated to range from $5,600 to $7,500 yearly. Parents pay less than $750 of this amount. Only about 60% of Swedish children are enrolled in day care centers. There is usually a waiting list at these centers, so the government also licenses "care minders" to take care of four or five young children in their homes. The Swedish government has opposed privately operated day care centers. Other countries in Europe have similar preschools regardless of the income of the family. In addition, handicapped children are mainstreamed with nonhandicapped in many programs ("What Price," 1984).

There are currently some demonstration models funded by the Office of Special Education Programs that involve mainstreaming handicapped children in day care. Such models should be useful if replicated by other day care sites.

The federal government must take some responsibility for working with states and local communities in providing quality day care for our young children, nonhandicapped and handicapped. A federal agency such as the Administration of Children, Youth, and Families, which has administered successful programs over the years, should study the problem, and develop a viable plan. But the federal government need not shoulder all the expenses. The states and local governments should also take some responsibility. Parents should be required to pay only a reasonable fee based on a formula that considers their income, number of children in the family, cost of living in the vicinity where they reside, and the like.

Mothers with low incomes have no alternative but to place their children in the least expensive day care program. Not every mother, however, should be forced into the labor market to bring in money

to support her family. One plan that might be even less expensive to the government is to give the mother the option of staying at home and caring for her children and pay her for doing so. A flexible plan whereby the mother might work a portion of the day, place the child in day care for the other portion, and be given financial assistance for the time the child is in day care, is another possibility.

Day care programs should receive additional financial support for admitting handicapped children, since these children's needs are greater and require more staff time. Mothers of handicapped children need some respite from care for their children even if they do not work outside the home.

Business should be given some financial assistance in providing quality day care for its workers. This arrangement should help industries and agencies obtain and retain good employees, ensure less absenteeism, and eliminate anxiety and guilt among working mothers by allowing them to visit their children during breaks and lunchtime.

In the *Newsweek* article, Ralph Nader refers to some day care programs as "children warehouses" ("What Price," 1984, p. 14). Recent accounts of child-molesting in day care and nursery school centers have made parents anxious about selecting a placement for their child. A handicapped child, especially if retarded, may be especially vulnerable to sexual or other types of abuse because of verbal skills inadequate to inform parents of what happened. Infants, handicapped or nonhandicapped, are at the mercy of day care staff. Standards for day care must be more stringent, including the training of the day care workers, and these programs must be monitored frequently to ensure quality. The pay of day care workers must be appreciably raised in keeping with the more stringent requirements for training. The turnover in day care is primarily due to low wages. What well-trained professional will stay in a position that pays only minimum wages?

INSTRUMENTS

The younger the child, the more difficult it is to identify a handicapping condition. It is relatively easy to identify the severely and profoundly handicapped child or the low-incidence child—the blind, deaf, severely orthopedically, seriously emotionally disturbed, or markedly mentally retarded child. Doctors, nurses, teachers, even neighbors are able to note and readily agree that these children deviate significantly from the norm. It is not so easy to identify the mildly and moderately handicapped child, especially during infancy.

Since screening is so important in the identification process, several instruments have been developed: the Denver Developmental Screening Test (Frankenburg, Dodds, & Fandal, 1970), Developmental In-

dicators for the Assessment of Learning (Mardell & Goldenberg, 1975), Developmental Screening Inventory (Knoblock & Pasamanick, 1974), Comprehension Identification Process (Zehrbach, 1975). To date, no comparisons of these instruments have been made on a research basis, nor typically have reliability data been compiled.

Experience testifies that it is imperative to conduct mass mandatory screening programs to locate all handicapped children; especially is this true of the mildly and moderately handicapped. To make sure that this is accomplished efficiently, it is important to use screening instruments whose reliability has been well established; to pass legislation that mandates screening at early ages, preferably down to birth; to require that pediatricians, general practitioners, and visual and hearing specialists register handicapped children; and to develop strong public information programs to promote early identification of and programming for the handicapped. A good screening and identification program is of little value without an ongoing program for serving the special needs of the handicapped children who are identified. It only causes frustration and anxiety among parents if identification and programming are not essentially a concurrent process.

Ongoing assessment instruments linked with curricula can be useful in pinpointing where the child stands developmentally and in providing the child with an appropriate curriculum. Many of these assessment instruments with accompanying curricula have been developed in projects funded by OSEP; however, they need to be carefully evaluated and revisions made that will warrant confidence in their use.

There is a critical need for instruments and procedures that enable researchers to determine whether certain important goals of a program are met, for example, self-concept, task persistence, language acquisition, creativity, social adjustment. Many tests are not highly reliable.

In the past, IQ measures have been one of the primary ways of assessing the value of a program. Currently we question whether change in IQ is the most relevant outcome of an early childhood handicapped program. We are cognizant of many outcomes which can result from an intervention program and we feel the need for instruments which tap various facets of child progress. Perhaps the reason IQ tests have been so popular is that they are the most reliable of the instruments available to us.

FAMILIES

In the last 20 years there has been a growing emphasis on the family in intervention for handicapped infants and preschoolers. Bailey and Simeonsson (1984) point out the phases through which this movement

has progressed. The first phase emphasized the parents' right and obligation to participate in the planning of their child's educational program. The second focused on the role of the parent in teaching the child. The third and present phase concentrates on families as targets for intervention. This does not mean that the first two phases are no longer important. On the contrary. Heretofore, when parents were involved in the educational program of their child; it was largely for the child's benefit. It is now recognized that families of handicapped children have unique needs that also require intervention. At the birth of a handicapped child, besides experiencing greater stress than when the child is normal, family members may face such problems as marital tension; not knowing what resources are available; rejection or lack of understanding by friends or relatives; feelings of loss of control; lack of coping skills to deal with the handicapped child; and characteristics of the handicapped child which inhibit interaction with parents and siblings.

High-quality programs for the child may be one way of meeting the family's needs. Still another is to help family members develop a support system including input from agencies, family members, and friends. Some family members may need specific training or counseling.

One encouraging trend, which began in the 1970's (Eiduson & Weisner, 1979), is the increased involvement of the father in child-rearing. "Father involvement is vital to helping families build internal networks of support that will enable them to meet the added demands of raising a handicapped child" (p. 64).

DeBerry, Restau, and Galland (1984) surveyed a stratified sample of early intervention programs in Minnesota (ages 0–5). Their findings have implications for getting parents involved. These researchers found that home visits were used extensively with parents of children under 3 and dropped off drastically when the child became 3. In one fifth of the programs, parents did not have the opportunity to participate in the classroom, in approximately one third of the programs there were no education and training group meetings. Over half offered neither group support nor individual counseling. In almost two thirds of the programs, parents were not involved in policymaking. Nearly three fourths of the programs did not maintain consistency in the training or support sessions. The investigators stated, "These findings present a rather alarming state of parent involvement in local level programs" (p. 183).

While educators of young handicapped children advocate family involvement and most programs for these young children claim to be involving parents, the breadth and intensity of the involvement are usually not documented. Casto and Lewis (1984) reviewed the efficacy

of early intervention with disadvantaged, at-risk, and handicapped preschoolers using a meta-analysis technique to analyze data obtained from studies conducted over a span of over 40 years (1937–1983). The findings suggest little support for the argument that parent involvement leads to significantly greater child progress. The researchers point out, however, that only a small number of the studies were conducted with handicapped children and also that the most frequently measured outcome was IQ change. In addition, most of the studies used only a pre/post design. It is questionable whether outcome measures in many of the studies were compatible with the goals of the family involvement program. Then, too, if the population of children were severely retarded, progress at best is slow and evaluation based on child progress might not prove as fruitful as assessment of family functioning. The intensity and even the specific ways parents and other family members have been involved in programs during the 1960's and 1970's are not always clearly documented. There is often a discrepancy in what the researcher thought was happening and what actually happened—which means, of course, that a written description of the program is not sufficient. There needs to be a careful ongoing recording of what actually transpired.

Much research is needed to determine specifically how each member of an interdisciplinary team can cooperate in providing the kinds of services family members of young handicapped children need. The outcomes of intervention with parents have not been clearly documented. Neither has the matching of family needs with involvement alternatives. Research that addresses the impact on the family and on the handicapped child of various levels of parental involvement is critically needed.

Bailey and Simeonsson (1984) discuss how researchers and interventionists are hampered by three major wants: "(1) appropriate and relevant models for understanding family functioning, (2) strategies and instruments for assessing family needs, and (3) a comprehensive approach for designing and implementing an integrated, individualized program of services for families" (p. 45).

EVALUATING PROGRAMS

The standard evaluation approach in early childhood education programs has been the two-group pretest/posttest design. Generally, data are collected on two sets of children. One set receives the primary intervention, the second an alternate treatment or no treatment at all. Both are given pre/post measures. Effectiveness is inferred from differences in the pre/post measures of the two groups. If the experi-

mental group demonstrates more growth than the control group, we conclude that we have a reasonable intervention.

Although the two-group pretest/posttest design has been the standard evaluation approach, it has several limitations. First, ethical and sometimes legal considerations (in the case of handicapped students) prevent us from assigning children to a no-treatment condition. Second, given the realities of doing field-based research, rarely are we able to assign children randomly to control or intervention groups. As a result, groups are generally not equivalent across important variables, which makes it difficult to determine whether group differences or the intervention in question account for differences in pre/post test scores. Third, programs are implemented in the field as opposed to laboratory settings. Uncontrolled, extraneous factors become confounded with treatment effects, thus further complicating the evaluation process and making definitive statements regarding the effects of the program almost impossible. Finally, pre/post measures generally reduce very complex constructs like IQ or task persistence to one score. Many have questioned whether these single scores actually represent something meaningful and suggest that these constructs need to be examined qualitatively rather than quantitatively. Clearly, there are enough problems with the traditional evaluation approach that changes are needed if we are to determine program effects efficiently and effectively.

In spite of the weaknesses of the pretest/posttest design, it has provided much useful information and will probably continue as the primary evaluation design. However, information gained from this design can be greatly improved if it is used with other methods that overcome the weaknesses of the pretest/posttest design. Evaluators will have to become far more sophisticated in their ability to match evaluation designs with evaluation questions. They must have a wide repertoire of research methodologies to help them determine program effectiveness, and they must have the ability to blend these methodologies creatively so that a weakness of one can be bolstered by the strengths of another. For instance:

- Single-subject designs can be used when it is impossible or unethical to assign students to control groups. Our own Task Persistence project is an example of such an evaluation design.
- Multivariate procedures such as LISREL can be used when extraneous factors are confounded with treatment effects to help delineate the relative effects of treatment factors and extraneous factors.
- Qualitative methods such as interviewing or content analysis can be used to help us explain how students learn a concept or to examine complex constructs such as IQ. The institute on the

gifted that we conducted this past summer (1984) was also evaluated using both qualitative and quantitative approaches.

Evaluation designs of the future will become broader-based and will most likely be hybrids of many different types.

COLLABORATION AMONG AGENCIES

With ever-increasing demands for programs and services to handicapped children and with budgets that are often inadequate, collaboration among agencies is essential for maximum use of the financial resources that are available. In addition, agencies that work together supplementing, reinforcing, and coordinating efforts can accomplish more than any one agency working on its own. Getting on another agency's turf should not be an issue if communication is good and goals and procedures are mutually agreed upon.

In the call for proposals in the *Federal Register*, for demonstration projects in early childhood, HCEEP required that evidence of plans for collaboration with other agencies be documented. No project, whether demonstration or outreach, can operate in isolation from other agencies.

WOMEN IN POLITICS

At one time, a woman had the opportunity to hold political office only if her husband's death allowed her to fill out his term. Nowadays women serve in all political capacities—as representative, as senator, as governor, as justice of the Supreme Court—even run for vice-president of the United States.

While there is no reason to suppose that women are innately more sensitive to the needs of children than are men, the cultural role in which women have long been cast may have made them more cognizant of those needs. On the other hand, men are apt to focus on such matters as balancing the budget, curbing inflation, or defense. Thus, it might well be an advantage to have more women in political positions where they would have the power to promote improved services to young children through legislative efforts. Currently, legislatures are dominated by men; and women could bring to legislative matters a different perspective.

It is to be hoped that as women become increasingly active in politics we will see more legislation beneficial to young children, including federal and state enactments that encourage public school programs for all children down to age 3 and services to parents of nonhandicapped and handicapped children down to zero. Until this

happens, it will remain difficult to mainstream handicapped children with children who are nonhandicapped.

Ideally, a limited number of handicapped children should be placed in a preschool class with nonhandicapped children instead of segregating them as is currently the practice. In the future nonhandicapped children also should have the benefits of attending a preschool provided by a public school without cost to the parents.

Mainstreaming handicapped with nonhandicapped children has been found beneficial to both. Some adaptations and innovations for handicapped children prove useful in promoting the growth of the nonhandicapped; for example, individualized education programs and precise techniques of assessing where the child is developmentally and programming accordingly are procedures that would be beneficial for the nonhandicapped child.

RESEARCH AND TECHNOLOGY

There are so many unanswered questions about educating the young handicapped child that the federal government should continue to provide funds, and in large amounts, for conducting research in the field. It may be fruitful for the government to have task forces of researchers determine the research questions we should be asking, prioritize these goals, and provide funds for investigations.

Among the questions that might be explored is the efficacy of using computers with young handicapped children. Well-designed and rigorous longitudinal studies should receive high priority. The affective development of young handicapped children is still another area of concern to educators that calls for well-designed research.

To date the critical age for intervention has not been settled, primarily because of the instruments and methods we have used to arrive at the answer. Neither have we been able to determine what approach works best for what children or why some children profit significantly from the use of one approach while others do not.

One of the concerns that persists, although the gap seems to be narrowing, is that of the generation of new knowledge through research and the incorporation of this new knowledge into practice.

SUMMARY

We have made real strides in early education of the handicapped in the last 15 years and will have to exert even more effort in the years ahead.

We need more research to answer critical questions. We need more and better training programs to prepare teachers, researchers, and teacher trainers.

We need to develop more reliable instruments for assessing and evaluating the components of a program. Certainly we have become more sophisticated in evaluating programs, but there is still much room for improvement.

Working with families continues to fall short of expectations, but in the years ahead, through research and training, personnel should become more competent.

Our legislators have not placed as high a value on the young child as have some foreign countries. Perhaps if we had more women in politics, legislation favoring young children would take precedence over other types.

We hope that, in the future, funds will continue to be forthcoming from the federal government, from the states, and from private funding agencies to seek answers basic to progress in this field of specialized service.

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CHAPTER 5

The Future of Early Childhood Special Education: A Perspective on Prevention

Keith G. Scott
Deborah T. Carran

Ten years ago an interdisciplinary program of research was established at the Mailman Center for Child Development at the University of Miami. The challenge was to bring together a health care system with the education system in meeting the needs of children. The strategy was to understand the needs of children, influence state policy, do critical research to help understand causation, and develop a model program to facilitate implementation. Superficially it did not sound too difficult. However, the course of progress in medicine has been quite unlike that in the social sciences.

In education there has been enormous progress in securing services through advocacy and the study of rights as they relate to unmet needs, which has led to legislative action such as P.L. 94-142, the Education for All Handicapped Children Act of 1975. The medical components of the Mailman Center interdisciplinary program had not

The preparation of this paper was supported in part by the Mailman Foundation and the Florida Diagnostic and Learning Resources System through a state general revenue appropriation for evaluation services in exceptional student education.

plotted their progress in this manner; nor had they ever dreamed of becoming involved in social advocacy since they tended to be politically conservative. However, they had made enormous and dramatic progress in caring for and saving children even when, as Elizabeth Boggs has suggested in her presentation, it might reduce their business.

In this medical world of pediatrics it became important to learn how progress was charted and how one could try to peer into the future and decide how to marshal resources. Special education has usually stressed "human rights," while the public health system has focused on "prevention." It became clear that legislators understood prevention in funding health programs. The arguments for its cost effectiveness are clear cut and are easily embraced by those of both liberal and conservative persuasion. It led to the question of how does one conceptualize prevention in special education. To resolve these differing views, it became necessary to view the future of early childhood education as an epidemiologist might.

Today epidemiology is not, as the name might suggest, the study of epidemics, although that is how it originated. Its roots lie in the study of cholera in London (Snow, 1936). Since that time, epidemiology has basically been a seemingly bifurcated science concerning itself with the patterns of disease occurrence in human populations (descriptive epidemiology) and the factors that influence these patterns (analytic epidemiology). More recently though, the public is most aware of epidemiology as the study of the causes of disease and the promotion of health through programs of public health that result in prevention.

Twenty years ago this discussion would not have been possible because many of the epidemiologic concepts now used had not been developed. Until the 1940's, the leading causes of death were acute infectious diseases, that is diseases caused by agents that lead to one episode of illness. By about 1940, chronic diseases such as cancer and coronary events became a major concern (Halperin, Gordon, Kjelsberg, Neaton, & Sherwin, 1977; Truett, Cornfield, & Kannel, 1967). They had long-term onsets caused by multiple factors associated with family history, environmental history, diet, smoking, and so on. In 1949, Page presented the Mosiac Theory of Hypertension. He proposed that there were risk factors for high blood pressure which combined like the colors in a kaleidoscope; if you shook them up, a new complex pattern emerged. From this theory came the multiple-risk factor models of heart disease and cancer.

What we have been doing is looking at the causes of mental retardation in terms of a multiple-risk factor model (Scott & Carran,

1985). In this way, mental retardation is viewed as a chronic disease with prevention at the heart of such a model.

GENERAL MODEL OF PREVENTION

A general model of prevention is best conceptualized through the use of the techniques of descriptive and analytic epidemiology. These tools facilitate the development and implementation of a prevention plan, while at the same time they conceptualize the relations among the various causes. In this way incidence, or number of new cases of the condition, may be reduced in subpopulations who are discovered to be at an elevated risk.

The general prevention model approaches any particular disorder in a hierarchical manner that involves three preventative measures, each targeted at a particular stage of the disorder: *primary, secondary, tertiary* (Mausner & Bahn, 1974). Each step of prevention will be discussed as it is seen to pertain to special education.

1. *Primary Prevention*: This means minimizing the level of risk for a disease. In primary prevention one promotes health and adjustment; gifted education is a notable example of special education as primary prevention. Normal preschool education also fits into this category.
2. *Secondary Prevention*: Secondary prevention occurs where a risk factor or disorder can be reduced, eliminated, or "cured." Working examples are Head Start and the Abecedarian Daycare Program (Ramey, MacPhee, & Yeates, 1982). Any early childhood special education program that aims to discharge its graduates to regular education is a form of secondary prevention.
3. *Tertiary Prevention*: Here, management of the disorder is the aim so that the patient may lead as nearly a normal life as possible by bringing the individual to his or her maximum potential. There has been a concerted effort in this country to improve the lives of severely and profoundly retarded citizens as a result of P.L. 94-142.

It is apparent how neatly these concepts map on to early childhood special education, especially in the case of normalization and services for the severely and profoundly handicapped. The incorporation of prevention into special education is necessary if we are eventually to reduce the prevalence, or number of existing cases, of some forms of mental retardation, specifically those forms that have traditionally been labeled as psychosocial retardation. To achieve this goal, how-

ever, the cause or causes of the condition must be identified and labeled as risks.

THE ROLE OF RISKS

Risk is a descriptive epidemiological concept indicating a probability that an event will occur. For a condition such as mental retardation, a general prevention model requires an encompassing review of social/environmental and biological risk factors. Each risk factor contributes individually to the condition of mental retardation, but the outcome is not always the result of the additive effect of the individual risk factors. More often, the resulting condition is due to the interactive nature of risks, or, more technically, combined multiple risk factors.

The reader will be familiar with one multiple risk factor model because of the widespread awareness of its usefulness in preventing heart disease. Exercise, eating a low cholesterol diet, not smoking, reducing salt (if you have high blood pressure) and, if you have had a myocardial infarction, being very careful to maintain a prescribed regimen are but a few of the preventions of which we are all aware.

You also know something about risk factor combinations in a general way. The effects are often not simply additive, since risks may combine multiplicatively. An individual who is hypertensive and who consumes a diet high in salt content is termed more *at risk* for cardiovascular problems than a person with low blood pressure who maintains the same diet. Risk factors like blood pressure are often "silent." That is, they are not obvious either to the patient or to the caregiver unless careful measurements are made and, in this case, it is the combination of blood pressure and diet, more than diet alone, which elevates an individual's risk for the development of cardiovascular disease.

Mental retardation is easily represented by a multiple risk factor model incorporating the effects of biological and social/environmental risks. Individuals who exist in poor environmental conditions are psychosocially at risk for medical problems and are concomitantly more biologically at risk for retardation. Therefore, being psychosocially at risk in the epidemiological model implies a heightened risk for some degree of physiological impairment, which interacts with the poor quality of the environment to produce a greater number of retarded individuals.

In early childhood, particularly for mild disorders like mild mental retardation or learning disabilities, the patterns are hard to discern. Much work will be necessary to develop tools to identify these individuals early in life, although very systematic efforts are being made

(Fagan & Singer 1982; Greenfield, Scott, & Sterental, 1984). The outcome is even more remote when one starts with the infant. Infant and prekindergarten assessment devices have inadequate predictive validity. It has been suggested that we need to use revised techniques in judging their effectiveness (Scott & Hogan, 1982).

It is important to emphasize that the major and most proximate measure of outcome for what happens in infancy is progress in school. The State of Florida spends over $60 million per year on health prevention programs for children, yet we do not know anything about their success since we tend to measure success by the absence of a condition or the degree to which gross failures occur. Gross failures are commonly those individuals who are sufficiently developmentally delayed to stand out in normal classrooms, as well as the severely impaired. One major future development will be the evaluation of prenatal and neonatal care in terms of tracking children through school, which is the only sure method of measuring success. The epidemiology of maternal/child health requires such data if we are to identify and implement intervention programs early enough in a child's life to reduce the need for long-term special education.

One risk factor that deserves further attention and research is low birthweight and its relation to handicapping conditions. Children born of low birthweight (less than 2500 grams, which equals 5 pounds 9 ounces) are about 2½ times as likely to need special education as are those of normal weight (Scott & Masi, 1979). These are the so-called "high risk" infants.

Over time, as can be seen in Figure 1, the mortality rate for low birthweight infants has declined. One persisting question has been the quality of life for the very low birthweight infants (less than 1500 grams, which equals 3 pounds 5 ounces) if they survive beyond the first year of life. If their life expectancy becomes essentially normal, does this mean that in the future there will be more children needing special education? The answer is both yes and no.

The available outcome data are very difficult to summarize because they are fragmented in both time and place. One major effort to evaluate the situation has been made (Budetti, Barrand, McManus, & Heinen, 1981). From this work, Table 1 summarizes the estimated outcome. Under *expected number*, Table 1 shows the outcomes that would be anticipated in 1978 based on data available from 1960. The *estimated number*, in turn, is based on data available from births in 1976. The *net change* column is self-explanatory.

What these estimates indicate is that the overall survival rate has improved enormously, and the number of survivors with moderate to mild handicaps has actually decreased markedly, but there is also an increase in the number of severely impaired children who survive.

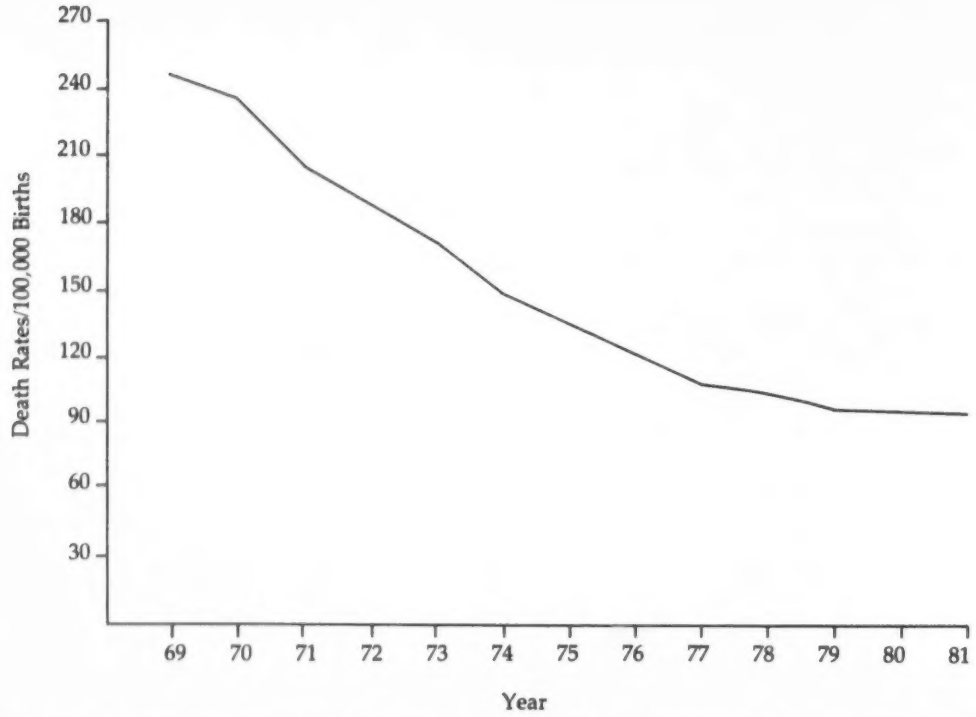

FIGURE 1. Infant mortality rates for unspecified low birthweight in different years for all races. The data are from Final Mortality Statistics reports for various years.

TABLE 1

The Change in the Outcome of Very Low Birthweight (<1500 grams) Deliveries from 1960 to 1978.

Condition	Expected*		Estimated**		Net Change	
	Number	Percent	Number	Percent	Number	Percent
Normal	2,790	7.0	18,833	48.5	+16,043	+41.5
Abnormal moderate	5,425	14.0	4,069	10.5	− 1,356	− 3.5
Abnormal severe	2,596	7.0	2,945	7.5	+ 349	+ 0.5
Dead	27,979	72.0	12,904	33.5	−15,075	−38.5

Note. Actual national data are not readily available.
*The expected distribution of outcomes based on data obtained for 1960.
**The estimated distribution for 1978 based on data obtained in 1976.

Note. Table adapted from *The Implications of Cost-Effectiveness Analysis of Medical Technology* by P. Budetti, N. Barrand, P. McManus, and L. Heinen, 1981, Washington, DC: U.S. Government Printing Office.

Since 1960, there has been a significant decline in the mortality rate of very low birthweight infants. Follow-up studies of these populations indicate that low birthweight infants are far more likely to sustain sensorimotor and intellectual handicapping conditions than full-term, healthy infants (Caputo & Mandell, 1970; DeHirsch, Jansky, & Langford, 1966; Nobel-Jamieson, Lukeman, Silverman, & Davies, 1982; Siegel, 1982). The increase in survival rates may be primarily attributed to the system of neonatal intensive care units having become an integral part of the medical community and their being truly perinatally oriented. However, the increase in survival rate for very low birthweight infants is accompanied by an associated increase in the prevalence of handicapped children.

With the average annual mortality rate for very low birthweight infants declining nationwide from 45% between the years of 1960–1975 to 30% by 1978, the number of additionally handicapped infants would be expected to increase by 1,200 annually since 1975. This expected number is based on an average annual morbidity rate of 20% since 1960 (Ross, 1983). As Ross reiterates, "Even if morbidity rates for all infants with birthweights less than 1500 g had not increased during the past 20 years, the mere increase in survival rates for this group suggests that the number of children with handicaps has risen" (p. 38).

The data indicate that infants born weighing 700 to 800 grams are at a great risk of morbidity. These extremely low birthweight infants are at a 50% risk for being handicapped. For every one of these infants judged to be developing normally by 18 months, there was another judged to be abnormal (Britten, Fitzhardinge, & Ashby, 1981).

The pattern of reducing mortality while increasing morbidity, especially in light of federal regulation to ensure maximum effort to save even the most impaired infants, will likely continue. Thus, there will be an increase in the need for services to severely impaired children for some degree of remediation for those with moderate to mild handicaps. However, the additional variable in the case of the latter is the concomitant shift in births to certain groups of mothers. Childbearing among mothers who are at greater risk is declining. This is evident through examination of data available on two of the maternal characteristics that are among the most powerful risk factors for low birthweight: maternal age and maternal education.

MATERNAL RISK FACTORS

For years it has been known that the youngest and oldest mothers were at increased risk for delivering low birthweight babies. The concern for maternal age is realistic when viewed biologically. Older

women are thought to be more at risk for some form of biological failure, while younger women are believed to be at greater risk due to their biological immaturity. However, studies done recently (Frisancho, Matos, & Flegel, 1983) suggest that low birthweight infants born to adolescent mothers may not be due to short gestation or gynecological immaturity alone. Rather, the increased nutritional requirements among rapidly growing teenagers compete with the growth needs of the fetus, thereby increasing the incidence of low birthweight infants among this age group.

Closely tied to nutrition is the mother's income level. Some years ago two of our colleagues (Monkus & Bancalari, 1981) showed that if one removed the bias caused by teenage mothers being predominantly from low socioeconomic backgrounds, the age effect virtually disappeared. In addition, as shown some years ago by Scott (1981), we have experienced a steady decline in births to teenage mothers. The so-called teenage pregnancy epidemic was due to misunderstood statistics and sensational press coverage.

Figure 2 is a graphic representation of birthrates for more than a decade. *Rate* is an epidemiological term that attempts to summarize an entire group's experience into a simple expression. In this instance, the birthrate represents the proportion of women who had a live birth experience among all the women in the population who could have had the same experience. This rate is further differentiated into age groups and specific years. This enables us to account for the different sizes of the groups of women in the child-bearing years and facilitates comparisons across years.

For example, in the year 1982 the rate of total births for the age group of 18/19-year-olds was 80.7, which is the birthrate per 1,000 women in this age group. This rate is a statement of probability that estimates the frequency of occurrence of a live birth in a specific age category. Interpretation of these birthrates reveals a declining trend in the incidence of teenagers giving birth, not the epidemic of teenage pregnancies that we have been led to believe.

The cause for concern generated regarding teenage pregnancies was attributed to an increase in the absolute percentage of teenage births that occurred. The percentage is accurate, but the reason is due to the decline in absolute number of births to women in other age groups. Therefore, although the birthrate for teenagers was declining, the birthrates for older women (particularly ages 20/29 years) declined at a much faster pace, which caused the distortion of percentages to occur in the teenage groups due to the reduction in the overall absolute numbers. Figure 1 shows this trend quite clearly.

The more powerful variable correlated with both the medical and outcome risk for children is maternal education. Given all medical records and personal characteristics, the overwhelming predictor of

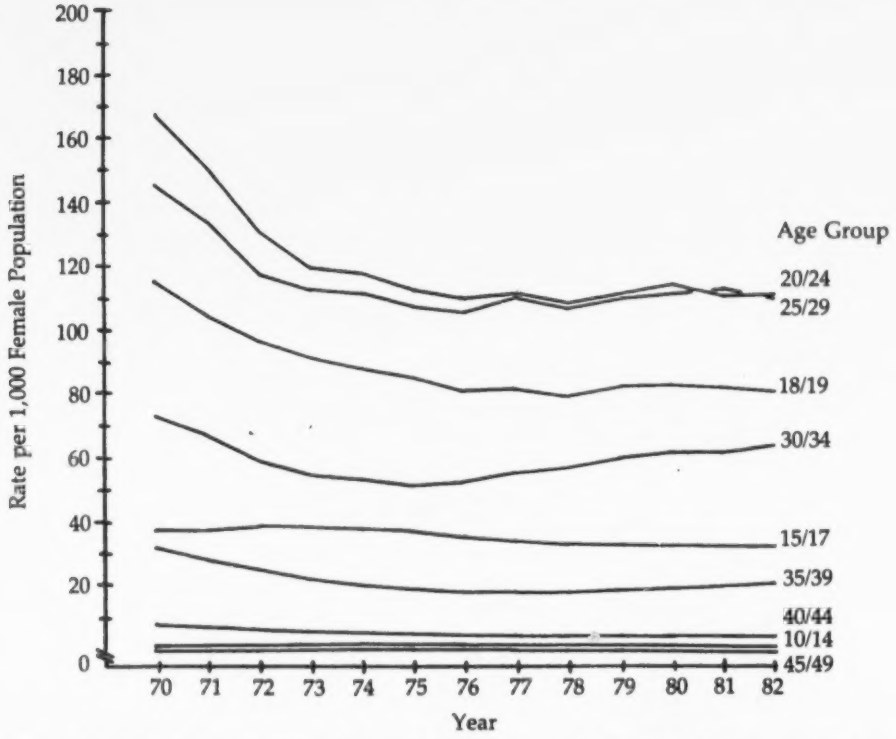

FIGURE 2. Birthrate, live births per 1,000 women, in specified age groups in the United States, 1970–1982. The data are from Final Natality Statistics reports and Advance Final Natality Statistics reports for various years.

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the physiological status of an infant at birth is the mother's educational level (National Center for Health Statistics, 1981).

Figure 3 is a representation of 1979 Final Natality Statistics charting low birthweight as a function of mother's age and education. The highest incidence of low birthweight is seen in women having 9/11 years of schooling who are in the age category of 40/49. The surprising lower incidence of low birthweight among women with less than 9 years of schooling, compared to 9/11 years, may reflect the fact that the incidence of fetal deaths is highest among women with the lowest educational attainment. Therefore, many pregnancies among these women end with fetal death rather than a live birth of a low birthweight.

The lowest incidence of low birthweight deliveries is among women with 16 or more years of education. This education category of women also has the lowest incidence of low birthweight for the age category of 40/49, indicating an across-the-board benefit of education. This finding is especially salient to the work force of women who have decided to postpone having children until their careers were established. The health of the child appears to be enhanced rather than adversely affected by such a decision, provided that the woman is in good physical health and takes precautions appropriate for her age.

The aforementioned risk factors and risk factor models are derived from modern medical epidemiology. In this way, mental retardation is viewed as any other chronic disorder, such as cardiovascular disease or cancer. This model mandates the necessity for incorporating both biological and psychosocial risks as contributors to the causation of mental retardation. Therefore, a prevention plan for mental retardation must use the tools of modern epidemiology and incorporate those factors that similarly affect chronic diseases.

THE FUTURE

The future of early childhood special education lies in prevention. Too many developmental problems, which require special education or some other form of intervention, are difficult to detect early in their course. For this reason, programs based on epidemiologic risk factor research may be the best prospect for prevention models. Through research, the identification of risk factors which contribute to developmental problems may be identified and remediated, precluding the need for long-term special education.

Meeting the goals of a prevention program will require an interdisciplinary effort through research, some initial input from the government at either the state or federal level, and a thorough understanding of the high-risk population. To achieve these goals

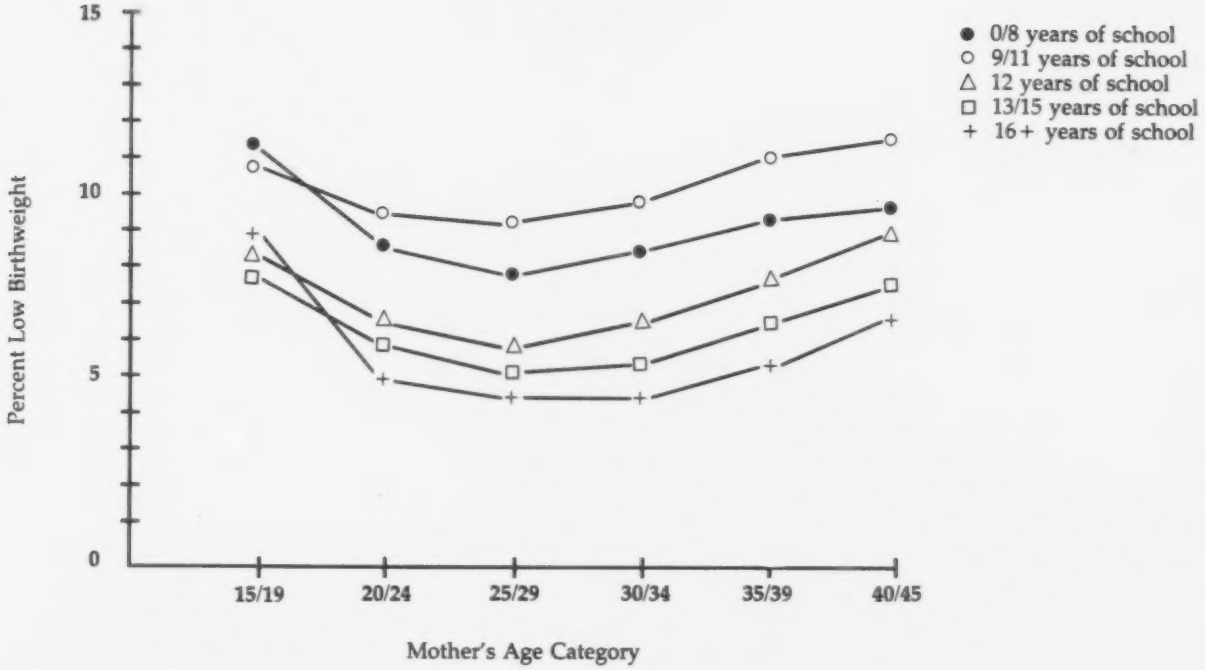

FIGURE 3. Percentage of infants of low birthweight born in 1979 to mothers of different age categories and with varying years of schooling. The data are from the Final Natality Statistics report for 1979.

while meeting the requirements mentioned, an analysis of the system and population as they exist now must be made.

1. *Severe Handicaps.* As we have seen, the increased rate of survival of the very small infant (birthweight less than 1500 grams) is leading to a modest increase in infants who are severely impaired. Unless there is a major breakthrough in medical technology, this trend will probably continue.
2. *Moderate to Mild Handicaps.* Improvements in two directions suggest that the absolute number of children who are at risk due to prenatal history may be decreasing. These factors are improved perinatal outcome as a result of improved medical care and a reduction in the incidence of high-risk births. On the other hand, improved instruments for early detection of mild disorders such as mild retardation and learning disabilities are likely to result in improved early detection and a resulting need for early intervention.
3. *Borderline Handicaps.* Two trends suggest that services for children who are delayed in maturation but not categorically handicapped will become more common. First, the evidence is clear that these services, as part of a prevention model, are cost-effective. Second, there will be more educated mothers who will be politically effective in demanding and securing appropriate early childhood education.
4. *Gifted and Talented Preschoolers.* The birthrate for women with a college education is steadily increasing. Maternal educational level is a powerful predictor of child outcome as measured by school progress (Ramey, Stedman, Borders-Patterson, & Mengel, 1978). There will be a systematic increase in the numbers of gifted and talented preschoolers with educated, professional mothers who will demand and secure services for their offspring.
5. *Coordination of Services.* Traditionally, child health and education have been separately supported and lobbied for. It is becoming clear that the most common unfavorable outcome of perinatal risk is school failure. Ultimately, child health care, particularly early childhood intervention, will become part of a continuum of services. This applies already to severely handicapped children, but it must become a truism for all children with special needs.
6. *Prevention Planning.* In time we will learn enough to create a significant epidemiology of early childhood handicapping conditions. The interaction of biological, environmental, and psychosocial risks will be studied and expanded in great detail. We already can sketch some major causative patterns. For instance,

> the high-risk infant's mother is disproportionately likely to be poor and to have little education. Social and familial factors have, first, placed her at greater biological risk. Second, her low birthweight baby will need special parental care, which she is likely minimally able to provide. Third, the offspring, due to the combination of social and biological risks, will do poorly in school.

Social-psychological, educational, and medical risks are bound in a cycle. One view of the future is to break this cycle through an effort directed at identifying contributing risk factors. It is clear that a prevention plan based on an epidemiological model can produce dramatic shifts in the incidence of a disorder.

During the last 20 years, through systematic attacks on risk factors for chronic disease, such as diet, smoking, excess weight, and pollution, our society has seen a decline in deaths and an improvement in recovery from the ravages of heart disease and cancer. In the next decade we will see the techniques of modern epidemiology applied to risk factors for unfavorable child outcome in school. The focus must move from a general prevention model to the specific prevention of school failure. At the preschool level, we will have to create noncategorical programs aimed at children who are born at risk for school failure due to any combination of social, biological, familial, and environmental risk factors. Federally seeded programs and privately funded programs, such as the Robert Wood Johnson Foundation Infant Health and Development Program, are important sources of research and development that target these specific at-risk populations. The ultimate goal of any special education project in this country is to produce generations of citizens who will enter the mainstream of education, and then of life, as both consumers and producers.

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CHAPTER 6

Technology and Special Education Futures: Paradigm Shift

Samuel C. Ashcroft

A paradigm shift is taking place in special education. New technology and its applications to the education and rehabilitation of handicapped persons are central features of this shift. As Marilyn Ferguson says in her book, *The Aquarian Conspiracy* (1980), "A paradigm is a framework of thought (from the Greek paradigma, 'pattern'). A paradigm is a scheme for understanding and explaining certain aspects of reality . . . a paradigm shift is a distinctly new way of thinking about old problems" (p. 26). Ferguson illustrates a major paradigm shift by the example of the change from a Newtonian to an Einsteinian understanding of how the universe works. The paradigm shift in special education may be of relatively comparable magnitude in its consequences for handicapped persons.

The technology-related paradigm shift in special education and rehabilitation is in keeping with John Naisbitt's (1982) megatrend toward high tech and high touch. As he said, "we are living in the time of the *parentheses*, the time between eras. As we move from an industrial to an informational society, we will use our brain power to create, instead of our physical power, and the technology of the day will extend and enhance our mental ability . . . yet the most formidable challenge will be to train people to work in the information society" (p. 279). The ultimate effects of this trend on handicapped persons are difficult to foresee.

Evidence abounds that this trend is already being felt in special education. Among the major consequences of paradigm shifts and the rapid development of major trends is the development of gaps or discrepancies between the "state of the art" and the state of practice. As Naisbitt (1982) also says, "The Gee Whiz futurists are always wrong because they believe technological innovation travels in a straight line. It doesn't. It weaves and bobs, lurches and sputters" (p. 37).

Today's discrepant situation is especially prevalent in applications of technology to special education practices. Thomas Gilhool (1982) has called attention to the "technology-forcing role of the law." He indicated that when Congress enacted P.L. 94-142, the Education for All Handicapped Children Act of 1975, it "was deeply aware . . . that we know how to educate disabled children effectively . . . but that knowledge has not been widely distributed" (p. 18). "Thus," he continued, "the Congress included phrases and provisions that were designed to evoke . . . to force, if you will—that technology . . . . it is of course forcing *distribution* of technology" (p. 18). Gilhool called attention to "the requirement for the use of the 'state of the *art*' as distinguished from 'the state of the *practice*'" (p. 18). Thus, although the paradigm shift is developing rapidly and its impact is beginning to be felt, there remain wide gaps between the "state of the art" and that status of our practices.

As Naisbitt (1982) also indicated, "By one estimate, 74% of all jobs by 1985 will involve computers in some way—and people who don't know how to use them will be at a disadvantage (p. 27). . . . although computer use in public education is still in its infancy, schools around the nation are beginning to realize that in the information society, the two required languages will be English and computer" (p. 29).

In assessing the impact of technology, the Office of Technology Assessment (1982) indicated that "modern society is undergoing profound technological and social changes brought about by what has been called the information revolution" (p. 3). Their report continued, "A key element of all of these educational needs is that they will constantly change. In a rapidly advancing technological society, it is unlikely that the skills and information base needed for initial employment will be those needed for the same job a few years later. *Life-long retraining is expected to become the norm for many people*" (p. 8). The same report indicates that "the Office of Technological Assessment found little evidence of current hardware limitations that would limit the applicability of technology to education and, hence, call for major research efforts. Continuing research in the general fields of computer science and engineering, coupled with innovative private sector development, will provide the necessary hardware base. *The only exception is the area of technology for the handicapped where it is not*

clear that the opportunities for developing specialized technology could be met without some federal support for R & D'' (emphasis added) (p. 9).

EXAMPLES OF WORK WITH BLIND STUDENTS

Today's capabilities for computer-based word processing illustrate the paradigm shift for visually impaired students. Today's electronic braille reading, writing, and computer access equipment is the most significant development in communication skills for visually impaired students in the 150 years since Louis Braille introduced his system.

In response to these rapidly developing trends, we have undertaken a modest program of Research on Prevocational Applications of Paperless Braille Recorders and Microcomputers for Blind Youth and Multi-Media Access to Microcomputers. We have developed information, resources, and skills that need to be infused into teacher education programs and student-use programs in the special education of visually impaired students.

As a general rubric for our work, we have oriented it in terms of guidelines by Weisgerber, Dahl, and Appleby (1981); who suggested strategies for overcoming mismatching between environmental demands and individual capabilities. These strategies are (a) to alter the capabilities of persons so that environmental demands can be satisfied, (b) to provide an environment that eliminates a mismatch, and (c) to provide a device to smooth the interface between the person and the environment at the point of interaction. We alter the capabilities of the person through instructional modules teaching the use of access technology and microcomputers. We provide an environment that eliminates a mismatch by enabling teachers to provide and to use the necessary equipment. We provide devices to smooth the interface between the person and the environment through specially designed and/or adapted equipment such as electronic braille and voice synthesis devices and means of enlarging computer outputs for those with low vision.

Our recently completed research project was designed to study tactual, auditory, and visual means to give visually impaired youth access to microcomputers. This project is a part of a long-range program of research begun in 1977 (Ashcroft & Bourgeois, 1980), for which we have projected plans through 1986. The research program involves visually impaired students and their teachers wherever they are located—in residential schools and local day school programs and at institutions of higher education. Students preparing for careers in special education of visually impaired children and youth also participate in appropriate aspects of the research program.

Access Technology

We define access technology as: *The equipment, equipment interfacing, software, instruction, and materials enabling independent use of microcomputers by visually impaired persons.* Equipment includes those devices providing tactual or auditory output or enlarging visual output. Such equipment also includes devices enabling handicapped persons to provide input to microcomputers regardless of their handicap. Interfacing is linking the special access equipment with the microcomputers. Software includes both the unadapted software and software adaptations or supplements required by access technology. Instruction and instructional materials are needed to enable visually impaired students to use the equipment independently.

We have limited our program to the use of commercially available peripheral equipment and software for use as access technology in preference to undertaking development of such devices and materials ourselves. In August of 1984 we began a project entitled *Teachers of Visually Impaired Students Can't Wait: Developing Writing and Word Processing Skills Through Microcomputers and Access Technology.* It is a joint project of Peabody College of Vanderbilt University and the Tennessee School for the Blind, sponsored by the Apple℠ Education Foundation through a $70,000 equipment grant.

The Apple Project: Developing Skill in Writing

The educational problem addressed is the development of skill in writing and the use of microcomputer word processing by blind and visually impaired students. Visually impaired students do not have the same access to microcomputers as their sighted peers, so they are deprived of the benefits of microcomputer and word processing skills.

Severe limitations may be imposed on the development of writing skills by blind students because braille writing is slow and cumbersome, corrective feedback is difficult to provide, and revisions are difficult to make. Braille word processing and microcomputers hold the potential for reducing these barriers. Through the Apple Project, microcomputers have been placed throughout classrooms, the library, and dormitories at the Tennessee School for the Blind for full access by students and teachers during the school day, evenings, and weekends. Teachers at the school and preservice teachers at Peabody-Vanderbilt are participating in inservice workshops for basic computer literacy, word processing skills, and instructional techniques. Major student goals include development of basic computer skills, use of access technology, and use of word processing to improve writing skills.

The project will serve as a national model for infusion of microcomputers and word processing capabilities into programs for visually impaired students and into preservice and inservice teacher education programs. Project products will include validated instructional modules to be made available at cost. Results will be disseminated through professional journals, professional conferences, and SpecialNET™. These projects are described in more detail in a special issue of *Education of the Visually Handicapped* (Ashcroft, 1984) on Microcomputers for the Visually Handicapped.

OTHER TECHNOLOGICAL DEVELOPMENTS FOR BLIND PERSONS

Perhaps the most dramatic and widely publicized application of technology for the handicapped is the Kurzweil Reading Machine™. The Bureau of Education for the Handicapped, the Veterans Administration, and the Rehabilitation Services Administration, along with foundation support, have enabled rapid development of this desk-top reading machine that provides automatically for converting print to speech output. Introduced in 1975, with an original cost of around $50,000 per unit, the cost has now reached about $15,000. The machine reads a wide range of type faces. Recent developments include the capability of automatically translating printed material into high-quality, full-page Grade 2 braille. A special interface enables the Kurzweil Reading Machine™ to convert English text from a computer or a cathode ray tube terminal into speech. An output interface enables temporary braille displays and other output devices to be used in addition to speech output.

A tactile reading machine, the Optacon™, is designed to enable a blind person to read by touch directly from the printed page. It consists of a miniature, hand-held zoom lens camera connected to a series of 144 vibrating pins. When the camera is passed over a line of print or other image, the image it collects is directly translated into a tactile representation through the vibration of pins. By placing a finger on the pins, a blind person may feel a representation of what the camera sees.

The Optacon™ has probably done more to open vocational opportunities for persons who are blind than any other device in recent memory. For example, a major airline has employed its first totally blind airline reservationist, who processes more than 80 calls per day. The applications of the Optacon™ include its use for a totally blind radio operator, for telephone operators, secretaries, students, and numerous other vocational and recreational possibilities. The addition of a spoken word output to the Optacon™ will enable blind users to

learn to associate the vibrating representation of the print letter more rapidly than in the past.

Some of the problems encountered by visually impaired persons attempting to solve mathematical equations have been resolved by a talking calculator. The Speech Plus Talking Calculator™ is a hand-held calculator specifically designed for users who are visually impaired. It has a 24-word vocabulary that announces each entry and result and its "speak" key enables the user to hear the display contents without performing any additional operation. Commercially available models costing $35 to $50 have now completely replaced the specially designed version.

The current boom in computer technology has opened a new world of employment opportunities to the visually impaired. By simply replacing one software program with another, a blind person can have an in-house telephone directory, an automatic forms writer, or the company's data management system at his or her fingertips. Another cassette program provides a transcription of print to braille; still another offers the manuscript editing features of a word processor.

By utilizing synthetic speech technology with a microcomputer, the names and telephone numbers of as many as 6,000 entries can be made almost instantly available to a blind telephone operator. The operator, using the Talking Telephone Directory, needs only basic typing skills to interact with the directory, which responds both vocally and visually with the requested information (telephone number, credit limit, room number, etc.). Standard features allow the operator to handle duplicate names and daily updates. A blind operator at the University of Kentucky handled 85 calls an hour as compared to 50 to 55 calls an hour for her sighted counterparts who used traditional methods of retrieval. Retrieval time from name input to number output is 6 seconds with the tape version and 1 second with the disc drive unit.

Electronic reading and writing machines are becoming increasingly available to blind persons. Several companies now produce such electronic braille writers, sometimes called Cassette Braille Machines™. These devices allow the users to record and store braille information on magnetic tape cassettes, the same cassettes used in ordinary audio tape recorders. Using a conventional braille keyboard, the recorders code electronic information on the audio cassette, which is displayed by an electromechanical reading board. Plastic pins represent the dots of a braille cell to allow the reader access to the braille characters. Because more than 150,000 braille characters can be recorded on one side of a cassette tape, the former cumbersome bulk of volumes of braille information can be drastically reduced. The storage space required for standard braille material can be reduced correspondingly.

As an example, the novel *Roots*, by Haley, which is comprised of 800 pages in print and would require seven braille volumes about 11 × 13 × 2 inches each, can be stored on just over four ordinary audio tape cassettes. The same book in recorded form requires 24 hours of recording on 14 disks or 5 audio cassettes at 15/16 inches per second. Thus, the four audio tape cassettes storing the braille for electronic reading is even smaller than the five cassettes required for audio reading.

Cassette braille machines have many other novel applications that enable blind individuals to experience and participate in activities with their sighted peers. For instance, they can be interfaced with electronic typewriters or computer printers. Thus blind users can check and edit in braille or audio form and convert it to letter-perfect inkprint form. They can also perform calculations for bookkeeping responsibilities by interfacing a microcomputer with a cassette braille machine.

A blind college student in a statistics course can interact remotely with a mainframe computer via telephone, producing a braille record and a print copy. The possible uses of this type of equipment are as extensive as the number of devices with which they can be interfaced and the imagination of the user.

In the area of mobility, other impressive devices have become available. The laser cane and the sonic guide are two electronic developments to assist the blind individual in detecting obstacles and preventing collisions. The Mowat Sensor™ enables a blind person to walk through a maze of objects of various sizes, shapes, and heights. Recent developments for the partially sighted open new educational and vocational opportunities through the use of electronic visual aids utilizing variable focus zoom lens television cameras and high resolution video displays. This equipment is becoming more compact and more portable than ever before. It enables partially sighted persons to read and write by enlarging the visual display on a cathode ray tube screen.

These exciting and promising developments in technology for visually impaired persons are described more fully in the *Journal of Special Education Technology* (Ashcroft & Bourgeois, 1980).

TECHNOLOGY FOR OTHER HANDICAPPED PERSONS

"Burgeoning," "proliferating," or "exploding,"—there seems to be no way to exaggerate the rapid development of technological applications with potential for special education today.

A recent conference, Discovery 84: Technology for Disabled Persons (University of Wisconsin, 1984), lists more than 100 sessions with such intriguing substance as the following:

Artificial Intelligence in Aids for the Disabled (attempts to have computers perform tasks that if performed by humans would require intelligence)
Bar Code Reader System for Handicapped Nonreaders
Communication for Nonvocal Physically Impaired
Electrical Stimulation of the Spinal Cord (an implanted electronic device activates neural control circuits)
Multiplexed Tactile-Vision Substitution System
Voice Operated System for Computer Programming

It is tempting to be overly-optimistic about the future of technology and what it can do for handicapped persons. It is difficult to assess the impact of behavioral and instructional technology on our field when we think of operant conditioning, behavior modification, programmed instruction, diagnostic and prescriptive teaching, precision teaching, and other manifestations of such behavioral and instructional technology. It seems fair to say that this movement constitutes a significant aspect of the paradigm shift and that it has dramatically and favorably influenced our treatment of severely, profoundly, and multiply handicapped persons and the curricula, and instructional programming throughout special education. Attention is now given to teaching skills of daily living to mentally retarded persons once thought incapable of learning. However, we are only beginning to explore how the new microcomputer and voice synthesis technology can further enhance learning with these very difficult cases.

The Exceptional Child Education Resources database now includes more than 60,000 references in special education. The major growth area of interest to special educators, according to CEC's Lynn Smarte, is accessing the database through microcomputers from home in evening hours. Bibliographic Retrieval Services has an After Dark program and a Dialog the Knowledge Index program that provide off-hours phone line access. CEC has an ERIC Digest detailing this and other information such as the Exceptional Child Bulletin Board on SpecialNET.℠ The National Association of State Directors of Special Education, which operates SpecialNET℠, found in a recent survey that 77% of the respondents monitored the CEC bulletin board, and it ranked third, following only the Federal Bulletin Board (which includes grant announcements) and the Computer Bulletin Board.

Vale (1981) describes computer-based adaptive testing which consists of test items based on the client's test responses. Thus, the test is specifically tailored to the individual to be tested. In its more sophisticated forms, adaptive testing includes interitem branching and intersubtest branching. In these modes the computer enables searching among items and among subtests for items at appropriate levels of difficulty for the individual to be tested.

Questions About the Future

Since this is a colloquium, and colloquia involve interaction and conversation, here are some questions I hope may be provocative.

Will the information age not only enhance the lives and learning of handicapped persons but, paradoxically, through its complexity also further complicate their lives?

Will we expect more of technology than it can deliver for the handicapped and special education and in so doing invest money, time, and effort that would be better spent in other ways?

How can manufacturers be encouraged to build their equipment in ways to enable their use by handicapped persons?

Will public funds enable handicapped persons to use technology by underwriting "thin market" access technology—the equipment, software, and instruction that enables independent use of technology by disabled persons?

Will today's high-tech solution to educational problems, like some other promising innovations, fail to achieve our expectations?

What problems will be revealed by the extended use of computer-assisted instruction (CAI), such as isolation, rejection, overprotection, and so on? Will handicapped students feel more, or less, in control of themselves and their world by using technology?

Does current knowledge about validating instructional materials apply to validating software?

Can CAI educational outcomes be validly assessed through a medium other than a computer product?

Will we emphasize routine uses of technology, such as drill and practice and game-type CAI, or will we use the sophisticated capabilities of the technology for facilitating learning such as Papert (1980) proposes in *Mindstorms*?

Such questions as these are only illustrative of the range and complexity of issues that need to be addressed. They become more urgent as we begin to cope with the information age in terms of handicapped persons.

As indicated earlier, in the report of the Office of Technology Assessment (1982), developing specialized technology for the handicapped will require federal support for research and development. As yet there has been only a miniscule investment in this technology that has high potential for enhancing the lives and dramatically increasing the productivity of handicapped persons. Vigorous advocacy for such investment is urgently needed if we are to realize the benefits that can accrue to handicapped persons and ultimately to all of us.

There are many signs that a true transformation—a paradigm shift—is taking place in education and special education. National awareness is increasingly evident as the information age makes its impact

throughout business and industry. The challenge to education is clearly present. How will we respond? What will the impact be? A large part of the answer surely lies with educational leaders such as those who are participating in this colloquium honoring Sam Kirk. He epitomizes the kind of "aquarian conspirator" who brings about such paradigm shifts.

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CHAPTER 7

Technology: A Look Into the Future for Special Education

Lawrence M. Stolurow

I want to take this opportunity to thank Dr. Kirk for the number of ways in which he contributed to my thinking and my work. I've never told him, but he has served as a model for me; each time I organized and directed a center or institute, I tried to follow Sam's example, or what I thought was his example. I never checked to verify. I simply inferred the basic operating rules of a Kirk type of center were: (a) assemble the best possible task-oriented interdisciplinary group (b) create a supportive work environment (c) keep the work environment reasonably protected from interference and (d) set high standards of productivity. Insulating the group and protecting them from interfering pressures within the institution seemed very necessary. Research and writing do not go well when there are many distractions.

In a different vein, one of my regrets is that I never ran the study Sam and I talked about during my IREC days. We discussed the study he did on the effectiveness of manual tracing in learning to write. I didn't want to replicate the study. I wanted to do a variation of it to see if the perceptual contribution of tracing was greater than the motoric for retarded learners. The studies on kinesthesis made me think that position cues played less of a role than the perceptual input from tracing. I think I would still bet on that outcome.

Now I would like to talk about technology and special education, my assigned topic.

BACKGROUND

It seems appropriate on this occasion to take a brief look back before gazing into the future. I will be talking about the future in terms of technology with special emphasis upon computer technology and its use in and impact on special education. My references to past events will be purposefully selective. I'll try to provide a perspective for looking at the future and will identify some threads in the historical fabric of instructional technology that relate the past to the present and future of this rapidly growing area of research and development.

University of Illinois—A Microcosm for Computers in Education

In 1954, when many of us who are here for Sam's birthday were working on the Champaign-Urbana campus, ILIAC™ had just been developed at the University of Illinois. It was then the world's most powerful computer. ILIAC™ was a first generation machine that required a tremendous number of vacuum tubes. It could be kept going only if students rushed around with shopping carts full of tubes and immediately replaced the ones that burned out. I also remember the comments made by faculty at that time; they often alluded to ILIAC™'s air conditioned quarters. While ILIAC™ had the world's largest air conditioning system to keep it running, the faculty offices had no air conditioning. The faculty, and students, were most envious. To most of the faculty in education the benefits of air conditioned offices were far more important than any that would ever result from a powerful computer for education. Few, if any, saw the computer as useful for anything other than data analysis. It certainly was not seen as a powerful tool for instruction at that time.

Five years later, 1 year after Bardeen, Brattam, and Shackley won the Nobel prize for the transistor, the Burroughs Corporation offered to give me a computer. It too was a first-generation, vacuum-tube system, of course. It was to be used in my computer-aided instruction work. I was excited by the prospect, but soon lost the glow when I found out it was a Trojan horse. The cost to put the Burroughs computer in the basement of Lincoln Hall, where the Training Research Laboratory was located, plus the cost of air conditioning and the cost of replacement vacuum tubes, necessary to keep it running, exceeded my budget by several folds. I felt I would be lucky to come up with enough money for the two students and the shopping carts. While exploring the implications of the Burroughs offer, I found out it would be cheaper, and therefore affordable, for me to lease a small, second-generation scientific computer, an IBM® 1620. This became the brains of SOCRATES™, the acronym for System for Organizing Context to Review and Teach Educational Subjects. SOCRATES™ lived in the

basement of Lincoln Hall for 6 years. Jack Carroll (then at Harvard), and Professors Patrick Suppes and Richard Atkinson from Stanford, among others, came to see it. Suppes and Atkinson soon after started their very successful computer-assisted instruction (CAI) research and development program. Representatives from IBM® came to see SOCRATES™ and later developed the 1500 system, which incorporated many features of SOCRATES™ and greatly improved the terminals. Some SDC (Systems Development Corporation) staff also visited; they later developed PLANIT, an excellent authoring language that took into account a number of processing functions, some of which we used with SOCRATES™. We also had many foreign visitors; I remember a group from Russia, one of whom had designed a trinary or three-state machine and another who translated my book *Teaching by Machine* (Stolurow, 1961) into Russian for distribution in the Soviet Union. Both CAI systems, SOCRATES™ and PLATO™ (Programmed Logic for Automatic Teaching Operations), grew out of a series of bag-lunch meetings of a small group of us who met at CSL (Coordinated Science Laboratory), then headed by Professor Dan Alpert.

About this time I published my first article while on a joint appointment in the Institute for Research on Exceptional Children. Sam encouraged me to write it. The title was "Automation in Special Education." It appeared in *Exceptional Children* in 1960 (Stolurow, 1960a). In the same year, another one of my articles, "Teaching Machines and Special Education," appeared in *Educational and Psychological Measurement* (Stolurow, 1960b). Even more directly related was a federally funded project that Sam encouraged me to get. The title was "Principles for Programming Learning Materials in Self-Instructional Devices for Mentally Retarded Children" (Stolurow, 1963). It was funded by the U.S. Department of Health, Education and Welfare. Henry Lippert, then a graduate student in special education, worked with me. We used SOCRATES™ in several interesting ways, one of which was to teach retarded children concepts using computer generated verbal lessons. We created a linguistic frame structure and used data reported by Underwood and his students at Northwestern (Underwood & Schulz, 1960). We formed a database used by the computer to design instructional lessons for retarded learners. They worked well. The children learned. I mention these things to report that the use of computer technology for instruction and research on instruction in special education was encouraged by Sam over a quarter of a century ago. This was only a few years after computers became commercially available. Relating these events to the first work with computers may put things in historical perspective. The ABC®, shorthand for the Atanasoff-Berry computer, the first electronic digital computer, which was developed at Iowa State University, and the ENIAC developed by Maukly and Eckert were completed in 1945. By

1952 Maukly and Eckert built EDAC, the first machine to use a stored program, an idea contributed by von Neumann. This was just 2 years after the marketing of UNIVAC®, the first commercially available electronic digital computer. Just 7 years later a computer was being used at Illinois for research on instruction in special education, and it created its own lessons for teaching verbal concepts to retarded learners. These were not drill exercises written and then stored for delivery to students.

Early Perceptions and Conceptions

Eight years after the EDAC was built, in 1960, my monograph "Teaching by Machine" appeared. At that time, most people in education were reacting to the mechanical teaching machines of Pressey, Skinner, and others, and to programmed instruction (PI). My conceptual and computer implemented model of teaching (Stolurow, 1961) was considered an oddity; however, Gage (1963) included it in his handbook on teaching. Most academics responded to discussions about the use of computers for instruction as sheer nonsense. Clearly the developments in computer hardware, then in its second generation, were moving at a much more rapid pace than was educational thinking and instructional software and courseware technology to support teaching and learning. My model of teaching involved the use of specific contingencies in decision making that would permit the computer to start the instructional process and to change it as it learned about each student through the student's performance while he/she was being taught. This general idea was "pie in the sky" to most educators in the early 1960's, and to many it still is. Since that time, artificial intelligence has developed within computer science. Consequently, we can foresee computer generated lessons and dynamic, adaptive teaching models becoming available in the near future.

Types of Courseware

If we apply to instructional software, or courseware, criteria for a set of distinctions between levels of computer courseware and call them generations, then the *second generation of courseware*, as I see it, was analogous to *branched programmed instruction*. It is courseware capable of relating to one, or more, prior responses of the learner. Contingencies that go beyond the last response require a computer. Only with a computer could the subsequent course of events be selectively different in accordance with characteristics of each learner, including his/her response history, while learning the task at hand. Two levels can be identified. One is response sensitivity; the other is response-pattern sensitivity.

Skinner's influence produced the first generation of courseware design; like PI, most early CAI was linear. The basic set of conditions for learning, which I refer to as the *learning cycle*, are a necessary part of CAI and therefore exist at this basic level, or first generation. PI also used the learning cycle—display, response, reinforcement, display, etc.—with, of course, reinforcement after correct response. All learners went through the same set of experiences except for knowledge of results, which varied with correctness.

Both the linear and the elementary-branched instructional designs are based on a single prior response. This generation of courseware has been implemented and used most extensively, and it works. Both the first and second generation of courseware are still being used. However, we now have more variety in the feedback. Games are basically an elaboration of first- and second-generation courseware design. Some simulations, however, represent whole new paradigms. These and some database courseware represent software for third-generation courseware.

Time-sharing

Time-shared computer systems came into being in the early 1960's. These systems looked as if they would be the solution to cost and access problems for those of us in education who were working with small grants insufficient to have a dedicated system. Time-sharing is the use of a single CPU by many different individuals, apparently simultaneously. Time-sharing implemented on a large mainframe made CAI more interesting economically. But the cost of CAI remained an important issue, for many years, for many educators, in spite of its rather widespread adoption.

Quality

Besides cost, the quality of courseware was another major concern of educators. The quality of computer courseware was often raised in regular as well as in special education. However, other instructional materials were seldom evaluated with the same rigor or level of effort. PI and drills on a computer seemed no better than in print, and both seemed to many educators to be uneconomical, unnecessary, and undesirable. Suppes (1965) later showed that computer delivered drills could be very useful to students. The issue remained, however: "Why should computers be used to do what a book could do, and at less expense?" First-generation courseware was often evaluated in terms of whether the students learned. Outside of reinforcement conditions, there was very little attention paid to design factors as evidence of their quality. Second generation tutorials were few and far between

in the early days. Their evaluation was primarily a demonstration of their ability to run. Reliability was more readily achieved than validity.

CAI, in any form, was as vulnerable to criticism as was programmed instruction. Although around longer, there was no more hard evidence of the effectiveness of books than of CAI. Now, of course, there is evidence of its effectiveness. In fact there may be more research on the effectiveness of CAI than of books.

Delivery Technology

The early computer technology made materials available to the student via a slow printing teletype or a monocromatic CRT. Delivery technology has improved greatly, but its evolution has not been shaped by instructional research and design. Design technology also has evolved and become more interesting to educators. Neither graphics nor animation was possible at affordable costs when CAI started. Partial answer processing had not been well developed as a feedback technique (e.g., Adams, Morrison, & Reddy, 1969), nor had it been used extensively. Many design features, presumably related to quality, were emerging as variable to be validated; however, to date we are no more, nor less, certain about the quality of computer courseware from a single viewing of it than we are of a teacher when we examine credentials, or a book or video production when we examine them. Clearly knowledge of valid design features is lacking for all forms of instruction. Instruction in none of its forms has achieved the status of a design science.

Software—Author Languages

Author languages for CAI sprung up at a fast rate in the 1960's. Each supposedly was created to make the author's task easier than it would be if he or she programmed in a general purpose language such as FORTRAN or BASIC. Secondly, the CAI languages were usually designed to make it easier to write tutorial CAI. They were called structured languages. IBM®'s Coursewriter was a prime example (see Frye, 1969; Zinn, 1969).

Many of the author languages were machine specific; therefore, the programs written in an author language would run on only one type of machine, or on a few other models produced by the same mainframe manufacturer (e.g., Coursewriter on an IBM® computer). PLANIT, a language developed at SDC, was an exception, but, surprisingly, it was little used even though programs written in it were highly transferable (Frye, 1969). One reason it was little used was that it was not supported by a computer company. The educator who used

it had to arrange to get it and to get the computer center to buy into it and support it. Another reason it was not used much was that it required a great deal of memory when memory was expensive and the mainframes it had to be mounted on were used by many other groups as well. Few computer center directors felt it was worth the effort and cost. PLANIT worked best if the system were dedicated to CAI, but few educators could afford it.

Low Priority

The low system priority of education in the 1960's and 1970's meant that CAI technology that educators wanted to use had to fit into a computer environment which was a time-shared mainframe with a computer language that would run on the operating system in use by the other users. The educators wanting to use CAI, were always at the mercy of the computing center personnel, who determined the nature of the system and controlled the software on the system. The operating system was determined by the computing center personnel, and other users typically chose the software and terminals that were made available to the educators.

Dedicated Systems Important for Education

I was fortunate to have at Illinois a dedicated machine for CAI, and no computing center to deal with. This did not happen by chance, however. It came about as a result of some of my experiences on the original planning committee for PLATO®. The committee met for bag lunches at CSL and when PLATO® started to become operational, I tried to do parametric studies to collect some basic data for use in system design. One thing we wanted to know, for example, was the number of seconds of delay a learner would tolerate in going through a program; another was whether it made a difference in the rate of learning to have a larger delay interval after feedback, before the next item, or between the response and reinforcement. Questions like these kept coming up in the very early days. At the same time, the engineers working on hardware had other questions. They wanted to know how different student stations were holding up. Consequently, PLATO® was initially set up to give hardware answers. All data were stored in terms of stations, not students. In order for us to track a student he or she had to use a particular station. If students moved to another station, we had trouble getting their records together. As an educator I was interested in tracking individual students to see if they learned, and what errors they made. With these kinds of conflicting needs, problems kept coming up. It seemed better for

me to do my behavioral studies on another system. So SOCRATES® was designed and put together. I mention this because my experiences were not atypical. Many educators in the early days of CAI experienced the low priority condition of CAI on the only time-shared, mainframe systems available to them. While not sufficiently recognized at the time, this was a significant factor restricting software and courseware development throughout education. Some people in IBM recognized this problem and produced a limited number of IBM® 1500 systems for CAI. These systems flourished for a few years, but IBM did not continue to support them, and they no longer exist.

Illinois Was a Fertile Microcosm

In retrospect, Illinois was a fertile microcosm. It had sufficient technical support and tolerant supervisors like Sam. The uses of computers for instruction there foretold much of the future of CAI. The early experiences in the 1950's and 1960's raised many of the persistent and still present problems of CAI in regular and special education. The reality is that the computer area has not stabilized. The future pace appears to be equal, if not faster, and equally exciting. Computer technology will continue to change for quite a while. We can expect to see a continuation of the trends we have seen, such as increases in computer power for less cost, increases in processing speed, reduced space requirements (miniaturization), increased reliability of system operation, more friendly systems, improved voice input and output, and more sophisticated AI capabilities implemented by both hardware and software design improvements.

SOME IMPLICATIONS

These early experiences were clearly not without their implications, some of which have been mentioned. Others might be pointed out to advantage.

Educational Users Need Independence

The main reason for creating SOCRATES® was to have the freedom to explore educational and psychological questions relating to instructional technology without the complications imposed by higher priorities in a time-shared environment. It turned out to be much more important to have control of a system than I realized at the time. When I went to Harvard in 1966 to set up their first CAI Laboratory (Stolurow, 1968), the importance of having a dedicated system became very clear to me, but it was unattainable there for reasons I won't go into here. Harvard had a time-shared IBM system for all of its com-

puting, scientific and administrative. The challenge was to use it also for CAI. SOCRATES II[28] was not completely implemented, nor was work in special education pursued (Stolurow, Peterson, & Cunningham, 1970).

My colleagues in the Harvard Computing Center had to be convinced that it would make no difference to the other users of the IBM® 360 if CAI were given top priority in the time-shared environment. The CAI users, reading and deciding on a response, took relatively long intervals of time so the computer was not being used constantly. CAI users created a sufficiently large number of time slots to allow the system to do a good deal of scientific or administrative work without any apparent delay. CAI actually used very little CPU time per learner. I mention this now for two reasons. One is that I feel system sharing inhibited CAI development. The other is that miniaturization and cost reduction over the years have made it possible now, and in the future, for the CAI users to easily have a dedicated machine. The educator no longer has to settle for a time-shared mainframe with other users. The microcomputer has made this possible; therefore, it bodes well for educational applications and particularly for special education. Personal computers for the various disabilities are a reality.

Quality Courseware Development Requires Time

Writing computer-based instructional materials takes time, is highly labor intensive, and depends for its quality on rare human capabilities. When completed, courseware typically requires revision. The normal cycle of the educational process that makes use of computer courseware is a school year. It takes that length of time to generate the student performance data that reveal the educational value of courseware. Then it is necessary to process the data. The next step is to draw the implications. The formative evaluation process is clearly a relatively slow process. Redesign and editing means retesting. These steps are not always accomplished *in vivo*, but they should be.

Clearly there are inherent differences in the tempo of changes in computer hardware, in computer software, and in courseware design. CAI systems development are sensitive to all of these elements. Clearly power analogous to that provided business applications by spread sheet and by the database managers has not been created for computer-based instruction. That will be a later generation of courseware.

Research *in vivo* Is Necessary

Prior to the microcomputer, only a few locations had the resources to obtain a dedicated system for CAI. The IBM® 1500 was not very

expensive in comparison with a PLATO® system, so there were many more of them. CAI developed in its sophistication and acceptance where dedicated systems were used. Time-sharing a mainframe in a heterogeneous user environment looked like it would be a great thing for the educational user, but in reality it was not. The educational user generally was the low man on the totem pole of users and was intimidated and constrained in exploiting the full capabilities of the system.

Related to this has been the problem of obtaining a close marriage of the development group with the student user group in an operational setting. Schools would seem to be a natural environment for a symbiotic relationship. In some military and industrial training situations this has clearly been the case. However, few public schools were able to institutionalize a computer-based capability that combined research and development with day-to-day delivery. Clearly there are sociological, or environmental, problems to be solved, in addition to the technical ones, if we are to make real progress in CAI.

Technology as new as CAI requires nurturing. New approaches in the design of courseware need to be validated. The special education needs are different in many ways from those of regular education. Within special education the various disabilities require special attention. Not only might there be a need for more examples and more drills within an instructional unit for a particular disability, but also different metaphors may be more effective for some learners than for others. Similarly, different mnemonics may serve different learners better than they serve others. Clearly the number of variables to be given attention is large and largely unstudied. The microcomputer could make a difference in the speed with which instructional design problems are studied, but the necessary research involves many studies and a large number of subjects. It is not going to be accomplished by separate laboratory studies. It is possible to collect all data in the field. To do this, research has to be planned, data have to be processed, and the results have to be fed back to design groups. Symbiotic networks involving developers, researchers, and schools are needed. Courseware has to be designed to capture data *in vivo*.

SOME CURRENT DEVELOPMENTS

Miniaturization Has Made Systems Affordable

What is happening to change things? The development and use of *integrated circuits* has generally been credited with producing the third generation of computers. These machines have small-scale integration, or SSI which permitted circuitry to be greatly reduced in size.

Further *miniaturization* produced the fourth generation of computers. These were made possible by an extension of the third-generation chip technology. The difference between the two generations is primarily in the number of components that each chip can contain. The fourth generation of computers is usually characterized as using LSI or large scale integration. A typical component could contain about two dozen of the third-generation chips and they could vary in their design. The smallest feature can be a millionth of a meter and a fourth-generation chip can be as small as 40 × 40 microns. Remember a micron is one millionth of a meter. Each of these chips can contain translators, capacitors, and other circuit elements together with the necessary wiring connections. This is a far cry from the miles of wire and hundreds of relays and vacuum tubes used to create the first American and British computers.

This trend in hardware, called miniaturization, made it possible to manufacture a table-top, self-contained computer system. By 1975 the table-top microcomputer appeared as a commercial product. One reason it is called a personal computer, or PC, is that it is all yours to use. You don't have to share it with other users. Each user has full access to the total system. Most PCs or microcomputers now on the market exceed the first and second generation computers, not only in power but also in other capabilities. *Chips* have truly changed the computing scene in a variety of important ways, and especially in ways that relate to educational and instructional applications in which we are interested.

We are now seeing lap-held microcomputers. How popular they will become will depend upon the extent to which they provide the same features as the desk-top microcomputers.

Advantages of Miniaturization

Reduced cost. One reason why a smaller system is better is that the cost to manufacture a chip is independent of the number of fabricated components it contains. Therefore, if more components are written with finer lines, the user is provided with more devices per dollar. Second, as more devices are placed on a single chip, fewer chips are needed and this means the computer is less expensive and processes faster. Third, as devices get smaller, they can be placed closer together and that increases the speed with which they can operate. It is estimated that by the end of the 1980's the number of bits that can be placed on a production memory unit will have increased to a million or more. It was fewer than 1,000 in 1970. Not only memory units, but also circuits are increasing in the number put on a single chip. Nevertheless, progress in this area is more difficult due to their com-

plexity and design costs. However, laboratory work on miniaturization already suggests that still smaller objects can be manufactured. For example, wire with a diameter of less than 40 atoms is possible now. It is estimated that objects one million times smaller than the smallest transistor will be produced for use in computers in the near future.

Ownership. The microcomputer should be viewed not only in its physical and financial terms, but also in terms of the independence it gives to the field of instructional design and technology. Education can now have its own systems to work with exclusively. It can set its own pace in terms of courseware research, development, and use. The history of science clearly demonstrates that progress follows from tool development; witness the telescope and the microscope.

Enriched instructional displays. It also is important to appreciate the increased capabilities of PCs, which are both affordable to the educator and very useful pedagogically, especially in teaching the special student. With microcomputers and current technology we can have programs that use graphics, including color and animation, voice input and output, touch sensitive screens and a host of special access devices to accommodate the very special needs of learners with disabilities.

THE STATE OF THE ART

CAI Works but Research Is Needed

While CAI has been around awhile the research has fixated on just a few questions. We can say with confidence that students learn from CAI experiences (e.g., Edwards, Norton, Taylor, Weiss, & Dusseldorp, 1975; Thomas, 1979). However, many voids exist in our knowledge of courseware design and delivery. Research on all aspects of instruction and the design of learning environments is critically needed.

Schools Need Help

We find that schools are in a very unsettled state with respect to computer technology. They have one or more microcomputers and are badly in need of courseware. Progress is being made in making teachers and students computer literate. As soon as a minimum level of literacy is reached by teachers, the realization sets in that CAI, CMI (computer-managed instruction), and CAT (computer-aided testing) materials are needed. This realization is occurring at a rapid rate.

Teachers and administrators have to make educational decisions and financial commitments about courseware as well as hardware now, but even the courseware evaluations entail problems and are few in number. Often the evaluations are made by one or just a few individuals. For most courseware no student performance data exist, and few schools are using student data as part of their evaluation.

Courseware

Groups of teachers are being recruited within schools and school districts to evaluate courseware. Without empirically established guidelines, their evaluations are subjective. Therefore, CAI courseware is often bought because it looks good, not because it works well. One lesson educators are learning the hard way is that it is wise to decide on the software and courseware before committing to hardware. The reverse sequence has been a frequent decision pattern with embarassing consequences, at best. If the hardware bought has little, or no, courseware one can use, it makes evaluation of little value. There are many problems in the schools that bought hardware because it was cheap. There is no relationship between hardware cost and the existence of educational courseware. Neither the cheapest nor the most expensive computers have much educationally useful courseware. The important point is that the primary investment will be in courseware not hardware. Courseware should be the primary concern of the educator, not hardware.

Most of special education is in the situation in which there is too little useful courseware. One reason is that developers of CAI are attracted to the thick, not the thin, markets, and special education has been a thin market. That is changing, however. Another reason is that it is more difficult and therefore more costly to develop good courseware for special educational needs. Clearly, more people need to be trained in special education who also have computer-based instructional technology training.

Another problem facing special education is the result of the way courseware is currently being produced; it is designed for the mass market. CAI materials are often produced to meet a set of objectives. The ones most often used in CAI development are for the average or above average student. The special student's (IEP) individualized education program typically has a finer grain to it than does the instructional program for the average or above average learners or for learners who do not have a disability. Also, the materials designed for the average student include a limited number of examples. The number may be insufficient for a student with a disability. While CAI programs can be used "off-level," neither the number nor type of examples

may be sufficient to meet the needs of the student with a disability. If the objectives are designed for the average student, they often are not analyzed at the level of detail required for the special student. A more detailed task analysis is often useful, if not necessary, for the special student for whom there has to be instruction at more levels. Also, the nature of the student's disability may require alternative ways of presenting information, for example, voice rather than print. These and related problems make the use of much of the existing CAI less useful, if not inappropriate, difficult, and more limited in its applicability than is desirable for students with disabilities.

Types of courseware. Research is needed to determine empirically whether the traditional approach of using drills is more effective than the games and game-like approaches for learners with moderate disabilities. Many alternatives to ordinary drills are now possible with CAI, but are they to be preferred? Instead of having students see two numbers to be added in a vertical, or horizontal, format, the student could see a frog jumping. Then the student can be asked how far Kermit the Frog™ went when he made two jumps. Although the arithmetic can be the same, the motivational effects may not be. While proponents of the game approach often beg the question by referring to that form of presentation as "motivationally enriched," we do not know if that is the case. Neither do we know the effects that adding context has on rate of learning, retention, and transfer of the knowledge or skill.

Other forms of courseware exist (e.g., tutorial), and are equally untested and unexplored in terms of their effectiveness in the various forms in which they are implemented. Instructional paradigms should be considered as an evolving breed. Not only their nature but also their names are changing as new software and courseware are developed. To some extent, the types are derived from the intentions of the author. For example, if the author's philosophy and intent is to develop inductive processes, the paradigm begins with examples from which common characteristics are later identified. Deductive materials follow a reverse pattern, sometimes called a "top-down" pattern, in which the general principle is taught first and then illustrated by examples.

Another approach to courseware design is growing in its availability and proponents, but it, too, is largely untested. This is the "discovery" or exploratory paradigm. It has many variations, but it is often referred to as *Piagetian* (Piaget, 1970). There are many questions, however. Not all materials called Piagetian really are. Also, the value of this approach to learners with various disabilities is unknown. Proponents of a cognitive approach argue that there are a number of

psychological advantages to exploration, discovery, and inductive learning. Among the conjectures offered by the various proponents are heightened student motivation, better learning, deeper understanding, more lasting retention, and greater ability to use what is learned (e.g., Bruner, 1963, 1966, Chap. 4; Taba & Elkins, 1966).

Also, increasing in its use is the *microworld* software, which often is confused with courseware. A prime example is the LOGO™ programming language. It and the "LOGO philosophy" have been used with special students (Papert, Watt, di Sessa, & Weir, 1979). With "turtle graphics," a LOGO™ capability, the child can control the movement of a character on the screen by using only a half dozen primitive commands, such as right and left, forward and back. The student sees immediate effects of each command and is encouraged to actively explore their use. However, there is no evidence that learners with low ability learn all of the things attributed to LOGO™, such as the presumed "deep" connections between the child's intuitive understanding of the physical world and fundamental concepts and principles of mathematics and physics (e.g., Papert, 1972, 1980).

It is not possible to make any better decisions for education about software or courseware than we can about books or videotapes. Unfortunately, there is very little valid data available relating to the effectiveness of *any* form of teaching. Research is clearly needed to determine whether the claims made for courseware design variables are valid. The evaluation of programs is complex. Simply determining that they work, and that some educators like them, is necessary and useful but not sufficient for the decisions that schools make. The determination of how much students learn from books, TV, CAI, and all other forms of instruction is needed. We need to know about all of them. In fact, the task at hand is much larger. We need to know for which children, on what measures, and under what conditions learning takes place and to what extent. Clearly, Aptitude-treatment interaction (ATI) effects should be looked for (Cronbach & Snow, 1977).

Special Hardware and Software

Microcomputers offer demonstrable help to individuals with special sensory and motoric problems (Krolick, 1984; Meyer, 1985). Some special students need braille; others benefit from voice output. Now the student with visual disabilities can have a microcomputer with useful output and input. The student with motoric problems can have special movement sensitive devices. For example, physically disabled individuals can now have devices attached to their microcomputers that provide them with the ability to communicate by moving their

lips or tongues. These devices can let them do a number of things not otherwise possible for them. Basic communication and control is not limited to the computer itself; they may interact with other persons through the computer. They also may control their wheelchairs as well as other devices, including speech generators. The computer may speak for them as well as move them in space. The disabled student needs to learn to use his or her limited capabilities to do these things. Since the environment the individual is learning to use is man-made and newly created, the way in which individual students are taught to communicate with and to control their environment represents an important set of new instructional problems. There are other problems also. For example, it is not clear what policy will develop in connection with providing individuals who have disabilities with the special hardware and software required for them to learn, to become more self-sufficient, and to become gainfully employed. The school's role in relating to the needs of these special students raises new questions of access and equity.

Curricular Questions and Needs

Information transfer, skill development, and motivational change are fundamental goals of instruction whether the instruction is accomplished by conventional means or by a computer. Schools are faced with the problem of deciding upon the role they want the computer to play. One option is to use the computer to teach traditional content (e.g., Atkinson, 1972; Suppes, 1965, 1966; Suppes & Morningstar, 1969). Drills and tutorials are the primary forms in which traditional content is programmed for school use. The computer is introduced with the intent of making the student's experiences more efficient, more effective, more useful, and more enjoyable. The use of games and simulations to make education more effective needs to be determined.

Another option is to use the computer to teach nontraditional content. The primary example is computer literacy. Turtle graphics, designed to teach thinking, is another example. The arguments offered for teaching children to program is that it teaches them a variety of skills involved in thinking and problem solving which are not as clearly acquired in the regular curriculum. This set of arguments has not been validated and depends for its validity upon the demonstration of transfer of learning. The assumption is that programming teaches planning, problem formulation, and problem solving. The nature of the problems to be dealt with by a learner at a particular level of knowledge and ability depends on the child's ability to represent the problems conceptually, or visually, since that precedes any coding or symbolic representation involved in programming. These

considerations obviously set some limits upon the potential value of teaching programming to students with intellectual limitations. In order to deal with the question of transfer of learning in an explicit way for students for whom it is a reasonable expectation, it is necessary to know with what level of difficulty and abstraction the students can deal. The demands of the problem can then be related to the student's ability. Ability, age, and/or grade levels need to be carefully considered as well as learning task requirements. To determine answers to curricular problems requires research and development, most of which remains to be done. However, the basic problems of when and to what extent something should be taught is not peculiar to computer-aided instruction. CAI simply has surfaced this set of problems. However, it also could be the best tool we have for getting an answer. To achieve this we need to design software, courseware, and studies that can be done *in vivo*, so that the results are an automatic biproduct of using courseware in ongoing programs. Research on instruction should not be something we do only in a laboratory. It should be something we do every day in the field.

Administrative Software

Since 1975 with the passage of P.L. 94–142 (Education of All Handicapped Children Act) and the state laws and regulations preceding and following it, it has been necessary for teams of teachers and other professionals to develop and update IEPs. Administrative computer software has been developed to assist this process and some of these administrative packages exist for microcomputers. Some of them aid in the development of IEPs and others are designed to monitor the student's progress. In general, this type of software has resulted in sizable time savings and related benefits to the child and the school.

The administrative process includes instructional management and software to monitor the progress of the individual students. This software makes it possible for a school to deal with the different rates of progress and different needs of individual special students both realistically and efficiently.

Computers, particularly the microcomputers, help keep the cost down for the services the schools must provide. With appropriately designed software the school can standardize its records and respond to information demands more rapidly and with less interference with the on-going instructional programs. It has been estimated that about one out of four microcomputers in special education is used for administrative purposes. The others are presumably used for instructional purposes. Projections would suggest that the proportion used for administration will go down, although the absolute number will increase for both purposes.

The software in use for school administration has mostly been the kind that serves a single purpose. Coherent, or integrated, multipurpose systems are less widely used. They typically require a large external memory which means a large capacity hard disk drive. As school administrators become more sophisticated, they will look for software and systems that meet several administrative needs. Enrollment, tracking, instructional monitoring, budget monitoring, and word processing have all been attractive types of software to administrators. Computer-managed instruction (CMI) software, while also of interest, is still not widely used. CMI that has diagnostic-prescriptive capabilities and runs on a microcomputer is available now, but is not widely used yet. It is necessary for teachers to be trained to think about their jobs in a different way before they can see the necessity for these systems. In addition, it is necessary to create a database of criterion-referenced tests for use in carrying out the diagnostic aspect of the IEP process. More difficult, and therefore slower in its appearance, is the development of a prescriptive database. To do this, it is necessary for each prescription to be collated with criterion-referenced test items. Since the prescription has to be something that can be implemented in the school, the available instructional resources have to be identified for each prescription. Ideally, the diagnostic-prescriptive process has to be capable of individualization. This means that each of the different prescriptions, one for each student, should be capable of being implemented concurrently during a class period.

CAI is increasingly being used to provide the very specialized instruction specified by an IEP. In this way variations in the need for additional practice, simpler material, special kinds of reinforcement and different instructional examples can be provided. While data are difficult to get, it is probably reasonably correct to assume that CAI is being used for language and math skill development more than for other areas such as social studies or science. Reading and word-attack skills, spelling, vocabulary, and comprehension would most likely dominate usage. Basic arithmetic is probably well covered since many drills exist for regular instruction and lend themselves to off-level use more than do programs that teach language skills.

Teachers appear to be of two minds. They like to have drills they can assign and prefer to have a computer deliver them. However, they often say they want courseware that they can modify to fit their student's particular needs and objectives. It takes time to learn how to adapt courseware and then do it. These modifications can be more involved than many teachers realize. It would seem that modifiable courseware will become more available, but that it will take a while for this type of courseware to become increasingly used by teachers.

Adjustable simulations are another development that some teachers want; however, it is too early to know the demand for it, and it may be of limited interest in special education.

Future Hardware Will Be Different

The computer architecture now available and the size, power, speed, and cost changes we have seen since 1950 are all related to what is called the Von Neumann machine. In October 1981, Japan's Ministry of International Trade and Industry (MITI) held a conference to announce what could become a totally new breed of machine, different from the Von Neumann machine in significant ways. It is sometimes identified as a *symbolic inference machine*. It is to be capable of high-speed reasoning, using massive amounts of data, as well as self-generated knowledge. This will be a series of computers designed to learn from experience; to make associations, inferences, and decisions; and in many ways to simulate human reasoning. These machines are being called knowledge information processing systems (KIPS). They are to be small, robust, and inexpensive, and are seen as *the* engine of the information society. They will accept voice input and have audio output as well as the more traditional input and output (I/0) capabilities. Of interest to us as educators is the fact that the KIPS are being designed with the explicit assumption that software, and circuits, should operate the way people think. The Japanese also accept as a given the need to have machines that operate with basic functions for nonnumeric processing of speech, testing, displaying graphics, and patterns as well as using artificial intelligence. This means computers will be designed to use heuristics more than algorithms.

Computers designed to associate. The Japanese are saying we need to design machines that emulate the way people are, rather than the way people should be if they were completely logical, unbiased, and omniscient in their thinking. One interesting point arising from this perspective is that we know how a perfectly logical machine operates, and we have machines that perform accordingly. The existing Von Neumann machines use algorithms to solve problems. On the other hand, we do not know very much about what constitutes a psychological machine in terms of the way associate memory, inductive, and intuitive processes work. Heuristics are less well explicated than are algorithms. The limitations in our psychological knowledge are a serious impediment to the design of 5G machines.

LISP[TM], a computer language developed in the United States several years ago, is now rapidly becoming the basis of machine architecture.

A new breed of computers is being manufactured and used in this country with the LISP™ computer circuits. One question the Japanese position raises is: Is the process isomorphic with that of a human learner's thinking? In other words the "new" machines may be capable of making associations among elements stored within them but these associations may not emulate a person's associations. Further, the processes employed by a user will be remembered by the computer, so the computer will use those processes in the future when the same person tries to solve a similar problem. These are important aspects of what is being called the fifth generation of computers, the Japanese 5G machines and our LISP™ machines.

The future of the fifth-generation computers is hypothetical. Their design can be thought of as including a set of heuristics plus the capability of remembering which of them was used by an individual. These computer designs are based upon relatively new and largely untested concepts and upon an emerging area called artificial intelligence, or AI. They add an additional challenge to the educational and psychological researcher. It is clear that the empirical data to validate the way information is processed by them are very meager at best. In special education, we want to know how robust these designs will be in their heuristics. Will the associative processes accommodate the deviant and disabled learner? It is possible to deal with many questions using existing machines. We badly need research designed to answer basic questions about the conditions of learning, retention, and transfer as related to courseware design and delivery.

Computers designed to teach. From an educational perspective we can speculate about a LISP™ or 5G machine's capabilities in providing instructional functions for different learners. The challenge is to create models of teaching that can be used with a microcomputer to determine basic relationships between design and delivery variables and their effectiveness with different learners. In order for the computer to perform the necessary and sufficient functions, information processing models of teaching have to be designed for each mode of instruction. We have only begun to identify the conditions and functions that characterized effective responsive learning environments. It also is necessary to identify critical information about individual students and about the subject matter to be taught. We know very little about the factors that should be considered in designing these databases. It is necessary to store a knowledge base in the computer, and it should be in a form that permits both maximum use and rapid access. The computer should also have processing heuristics that per-

mit it to search and select from its database pertinent information for a particular student who has specific needs. For example, a 10-year-old child with a particular learning disability who needs to be taught to read will require a different set of heuristics and a different database from the one required by a mentally retarded 8-year-old child who needs to be taught to add. While we can write the code to store programs and data in ways that work, using current psychological and pedagogical knowledge and Von Neumann machines (e.g., Stolurow, 1975), we have only scratched the surface in terms of the potential that exists with these computers, let alone a LISP® or 5G machine. One of the differences between the existing and new computer will be that some things which are now hard to do will be easier done and better accomplished with a LISP® or a 5G machine. The new systems will be designed to learn about a student from the ways in which he or she uses the system. For example, inquiry patterns will be remembered. Educational researchers will have to learn to identify critical patterns and ways to use this kind of information to improve the capabilities of the computer as a teaching tool. Consequently, whether Von Neumann, LISP® or 5G machines are used, progress in system design will depend upon close interaction between designers of software and courseware and the individuals who use them. Theoretical research as well as applied research is clearly needed, and because of the large number of problems the research will have to be largely carried out *in vivo*.

When we write CAI programs now we do not take advantage of existing computer capabilities. For example, few have taken into account the different levels of decision which may be usefully considered when different students' response histories appear, but they could. Most CAI programs use only the very last response in making branch decisions, and the same decision is made for all learners who make a particular response. This is called "response sensitivity." Today, the program that provides the 10-year-old with the drills consisting of pictures and words to teach a sight vocabulary also provides everyone else who uses that program with the same content in the same way. However, with "response-pattern sensitivity," the sequence and/or content could vary for learners who made the same response. Many teachers might do this under the same conditions. Since a specific mode of teaching may or may not work for a particular student, a smart CAI system, that was sensitive to response patterns, should change its mode of teaching. A 5G computer designed to teach would start with a predetermined mode of teaching. It would detect each student's needs for information, explanations or examples. It would use the learner's failure pattern to make a decision to change

the content and/or mode of teaching. It would also *learn not to use* a mode of teaching with similar students in the future if that mode turned out to be ineffective. It would be learning about teaching.

It would seem that if one were to carry out a mode of teaching on a LISP® or 5G machine which is now accomplished by a Von Neumann machine, it would be easier to do. While the process could start out to be the same on a LISP® or 5G machine, the changes that might take place could be different. There would be a difference in what goes on within the two computers. If a LISP® or 5G machine were doing the teaching, more computer processing would be involved. The computer *would emulate a more complex teaching model and process the data needed to implement it.* With the LISP® or 5G machine more processing would be done by the circuitry. The system would respond differently depending upon who the child was and the response history of that child. Heuristic programs or heuristic circuitry would be used either to change or to maintain a mode of teaching. The particular characteristics of the learner and of the learner's responses that would be taken into account in making a decision at any point in time might be different, depending upon what the system had learned. The assumption is that a LISP® or 5G machine will be able to do all of this faster and at a higher level of complexity than is now possible with our present computer designs.

If we consider instructional modeling in greater detail, the analog of the teacher's direction of attention to a child's performance would be the computer selecting the information it will use in a calculation at a point in time. There will be a heuristic available which will determine what elements of data the computer will select from all of its available information. The heuristic used may have been designed so that it selects a different subset of data at one time from what it selects at another time. It is assumed that a heuristic might use only some of the available data, not all of them. One type of thing the computer would be designed to learn would be to select data, for example, the most recent response or responses to analogous problems. In doing these things it would be learning about individual students as it taught them. It could look for correlates between past performance and current response patterns. It seems reasonable to assume that the heuristics would identify and use successful common patterns of students in making decisions about what to do next. However, where the previous decision did not work well, a different decision would be made, one employing a different heuristic. In this way *it could learn about the value of students' response data as much as about individual students.* It may start out to teach inductively with a student who has certain characteristics, and, if that does not work well in terms of errors or time taken, it would change its mode of teaching. Having done this it would "remember." Then the next time it would teach a

student with the same pattern of characteristics deductively. To do this a heuristic has to include procedures for detecting critical student characteristics and critical elements and patterns of responses. It will use, test, and selectively reuse decisions based upon the results obtained. The amount and kind of information needed in making decisions will be treated as experimental variables. Not only does the heuristic have to implement a plan, it also has to analyze data to find relationships it can use in making later decisions. The system has to be designed to find and use critical elements and patterns. It also has to be designed to process data in appropriate ways. I assume that the LISP® or 5G machines would be designed to optimize learning, retention, and transfer. The designer of the system has the problem of being more specific about the data to be used to optimize them. A research problem particularly important for special education lies in identifying variables affecting the rate of learning, the degree of retention, and the extent of transfer within each subject matter and/or skill area.

THE NEXT 5 TO 10 YEARS

Hardware Trends

While the hardware trends of increasing power, speed, and memory capacity will continue, as will the reductions in cost, because all of these are market driven, the schools will continue to use the machines they have and ones like them for the next 5 to 10 years or until they wear out. Exceptions will occur primarily at the upper grade levels, especially in programs that train students to use computers for employment. I see the elementary schools gradually inheriting the hardware originally bought for the secondary schools. It will be the middle and high schools that will get the new, more powerful, faster, and more versatile machines. Shifts of this kind will take place over the next 5 to 10 years. Special education will have to fight for its share of the more capable machines, which are potentially more useful for its purposes. Since the bulk of the special education students are aligned with elementary education, my prediction is that the machines now in use and their look alikes will continue to be the primary ones used for them over the next 5 to 10 years.

Clearly RAM, random access memory, has become cheaper and the companies have emphasized this system component in their ads, telling you the amount of K one gets at a price. The "RAM war" has led to microcomputers with bigger and bigger internal memories. A recent news release tells you that you can go from 128K to 256K on your MacIntosh® for about $2.50 per K, or per 1000 bytes. In fact you can buy static memory for less than $2 per K-bytes for your IBM® PC

if you shop around. It is estimated that within 5 years memory will cost 15% of what it costs today. By that time the smallest machines will have one megabyte (one million bytes) and many will have more. A 10-megabyte personal computer will probably be a common size of RAM within 5 years. That will make it possible to use more complex software; it will mean that the adaptive or teaching capabilities described will be readily accommodated.

ROM, read only memory, will be included in more machines. Some of the way ROM will be used will be to provide packaged programs such as an operating system, a text editor, and computer languages such as Pascal®, BASIC, or LOGO®. I can see instructional heuristics delivered as ROM modules. If we can master the teaching model, it could be put into ROM, and this could be a fourth generation of CAI. Some manufacturers feel that ROM technology might encourage new development since piracy would be much more difficult than it is with floppy disks.

Hardware Adaptations

EROM, erasable read-only memory, will be provided in the new micros. It will let you reconfigure, or tailor, your microcomputer to your liking. For example, you might want to reconfigure your keyboard. You also might want to customize your computer in other ways as well. If you are interested in changing your keyboard, for example, you may want to reassign the keys to the arrangement of the DSK (Dvorak simplified keyboard) (Dvorak, Merrick, Dealy, & Ford, 1936). As many of you know, the present keyboard that every touch typist must learn is, in its key locations, an accidental result of early models of typewriters. The key locations that we live with resulted from mechanical difficulties which the engineers had in locating the keys in the machine. These difficulties disappeared long ago, but their curse lives on. For example, the load is greater for the left hand than it is for the right. It is a 57% to 43% distribution. If you have a microcomputer and never learned touch typing, you would certainly benefit by having the ability to relocate key positions relative to your fingers and hands. This kind of change could be very significant for special education since the relocation would make the typing task easier to learn. Not only would errors be reduced but also rates of typing would be increased.

Access Devices for Communication

Special education students who are physically handicapped now have many access devices available to them in addition to the standard and

DSK keyboard (Carman & Kosberg, 1982; Romanczyk, 1982; Rushakoff & Lombardino, 1983; Sandals, 1979; Thorkildsen, Bickel, & Williams, 1979). Access devices such as enlarged keyboards, joy sticks, and tongue control units provide interfaces to a microcomputer that can have powerful intellectual and motivational effects for the student with a disability. The severely physically impaired individual with uncompromised or minimally compromised intellectual abilities can gain control over information and his/her environment in significant ways. With a basic system consisting of a microcomputer (48 or 64K RAM), a disk drive, and a monitor or home TV, preferably a printer, and one of these keyboard adaptations, an athetoid or other severely physically handicapped person, for example, can communicate effectively not only with a computer but also through a computer to the world at large. There are several alternatives to the standard keyboard to permit this: (a) expanded keyboards (b) software-based simple- and multiple-switch control (c) firmware single- and multiple-switch control (d) hardware single-switch access and (e) keyguard for the standard keyboard.

The *expanded keyboard* is simply a large board with large keys and generous spaces between them. The Computer King™ Keyboard, for example, has keys with 1¼" diameter and they are slightly recessed.

Single-switch operation can be used in three different ways. Rushakoff and Steinberg (1982) developed the Florida Scanner™ which modifies the keyboard entry program with a scanning subroutine. Another is Schwejda's (1982) Special Inputs Disk™, which illustrates how software can be used to transform keyboard entry into a single-switch entry. With a single switch all letter or number characters are arranged horizontally on the bottom of the screen. A cursor or pointer moves from one to the next until the switch is activated. That action tells the computer it is the desired character. The switch can be controlled by the tongue or an eyelid, for example. The space bar also can be used to do this.

In another single-switch approach that uses binary input, the person learns Morse code and then uses dots and dashes to communicate with the computer. The characters that the user generates by entering code appear on the screen as alphabetic letters or numbers. Once the characters are entered, devices such as Echo II® or Votrax™, which are speech synthesizers, can convert the text into speech. In this way a handicapped person can not only see what he or she created but can also hear it. In addition, the material created by the handicapped person can be read on the screen or heard by someone else. For the Apple® there are both firmware and hardware adaptations which allow the user either single- or multiple-switch control.

Keyboard guards prevent erratic movement and unintentional entries. They do not alter the keyboard in any fundamental way.

Access Devices Open Doors

When physical rather than cognitive limitations are the learner's form of disability and interfere with school work and academic progress, it is possible for typical CAI programs to be used. They often can provide individualized instruction in accordance with an IEP. Some modifications of existing CAI programs would be needed to accommodate an access device. The rate of progress a learner makes would still be under the learner's control and the locations in which learning takes place, either school or home, could vary as could the time at which learning would take place. Not only can academic accomplishment be greatly accelerated, but also the hope and self-perceptions of the learner can be greatly enhanced. With a microcomputer, the range of experiences can be extended significantly. Reading, writing, speech, and art as well as recreational games become a part of the accessible world of handicapped individuals equipped with a microcomputer. Even vocational opportunities can now be considered by the physically handicapped. Goldenberg (1979) pointed out that "jobs exist that depend more on the manipulation of information than on the manipulation of things" (p. 13). Since we are increasingly becoming an information society, the next 5 to 10 years would appear to hold a great deal of promise for many physically handicapped persons.

Microcomputers are being programmed to control videotapes and videodisks. Consequently, an access device linking the disabled individual to a microcomputer can make possible the experiencing of these other media as well. Just as talking books became a real and an available aid for the blind, with the cost and size reduction of the microcomputer it is not far-fetched to assume that private foundations, companies, counties, states, and possibly the federal government will provide microcomputer systems for the physically disabled. One way some could be made available would be through local libraries.

Support Systems Are Needed

It is important to consider not only the means by which the microcomputer system can be made available to needy disabled individuals, but also the support system required to accomplish this effectively. The configuration of a human support system with access to the particular hardware involved should be considered carefully and not left to chance. Individual needs in terms of the nature of the physical disability, the intellectual capabilities, and the age of the person are among the many factors to be considered in fitting a microcomputer

to an individual. We need to think of fitting computer systems analogously to fitting hearing aids and glasses. The handicapped individual or the family, left to the mercy and knowledge of a typical computer store, is not likely to obtain an optimum solution in terms of either the individual's needs or the available resources. Therefore, individuals with appropriate educational and clinical competence have to be available to deal with these problems. In the next few years educational institutions will have to take the initiative to create programs that prepare professionals to deal with these problems. It is not clear who will employ such people, but it is clear that they are needed. Personnel with educational-clinical-technical expertise who are supplied with a database of information about hardware and software will become a new type of professional.

The groups of learners with sensory handicaps, especially those with hearing and visual disabilities, have for many years utilized devices that could be coupled, or interfaced, with a microcomputer. Some of these devices have been adapted to large systems. New media such as the videodisk have been added to the list of computer controlled devices of use to the handicapped. CAI in several forms has been extensively used by the deaf and hard of hearing. The microcomputer with its powerful graphics and animation capabilities, as well as its ability to control color displays, is becoming a significant aid to the deaf and hard of hearing, particularly in relation to teaching abstract concepts.

In the short term I see better software developed for the deaf. It will be more appropriate for their needs and deliberately aimed at teaching abstractions. The instructional technology and research needed to make animation and three-D graphics more effective as ways of conveying abstract concepts is a real challenge for future research. To achieve results will require time and more resources than are now available. I do not see the rapid development of courseware designed to meet some of the most critical needs of the deaf, their ability to deal with abstract concepts. Interactive video using microcomputer controlled videotape, or videodisk can display dynamic concepts that are academically and intellectually useful. Although relatively inexpensive by some standards, these devices are still an expensive component for many individuals with disabilities. Right now they are hard to justify since so few educational packages are available. It will take a few years and some targeted development funds to create enough instructional material to justify the added cost to an individual of a commercial tape deck with solenoid controls, or a laser videodisk player.

Braille devices have been coupled with larger computers, and the microcomputers provide the same capabilities. They too can serve

many of the needs of the blind, as well. Of potentially great value to the visually handicapped are computer controlled speech generation devices, such as Echo II®, Super Talker™, and Votrax™. These devices can read the text displayed by a microcomputer. The synthesized speech produced by these and other relatively inexpensive devices is of reasonable quality now.

Also available are voice input devices. The microcomputer can accept the speech of a blind or visually handicapped individual, so that keyboard entry is no longer essential for use of a microcomputer. Intro Voice™, for example, is designed for use with an Apple®II, Apple® IIe, or Franklin™ computer. This device lets you use voice and keyboard concurrently. It is placed in an adapter slot and it has its own 8K of memory on the board.

An individual in a wheelchair or prone on a mat can use his or her voice to activate an appliance in the room. If the individual can say "TV," for example, he or she can turn on or off a television set and, by making another sound, change the channel. The same is true for controlling a thermostat setting. If speech is limited, it is still possible for the individual to activate a program in a computer that retrieves a file, the content of which when displayed is turned in to speech. Therefore, if the individual can only say "Ta," the system could say "I want to go to the toilet."

The Skinner box was an interesting and useful environment, but with microcomputers it is now possible to create a learning environment much richer in its sensory stimulation as well as adaptive to toilet and food needs of individuals. With properly located and appropriately interfaced sensors, an infant in a crib could turn on and off a videodisk or videotape. Sucking, crying, and other responses could control the auditory and visual stimulation or even access to food. Obviously a great deal of research is necessary to develop the systems to do these things intelligently, but the technology exists to implement the events and to cause them to occur at the proper times.

For voice output, individuals with visual handicaps can have not only the courseware that uses Echo II®, Votrax™, and Super Talker™, but also courseware that uses the system developed by Borg Warner which, while more expensive, is of high quality. It, as well as the Echo II® and Super Talker™, uses digitized human speech as well as speech synthesizers. In other words, for digitized speech, a voice recording is made and then processed by digitizing and editing it. This technology produces a better quality of speech than synthetic systems. Since the storage of speech requires a great deal of memory, the typical microcomputer with only 48K or even 64K of RAM and a floppy disk drive cannot store very large amounts of digitized speech. Borg Warner's board, on the other hand, fits into an auxiliary device

slot in the Apple® and has its own memory and two processors. This means that the speech it produces is handled by the board, so that none of the memory capacity of the Apple® is taxed. Echo® works in a similar way.

Courseware Trends

Many factors argue for slower changes in software and courseware than we might like. One is that it will take courseware developers 3 to 5 years to recover their investment in developing the courseware they are marketing now, and there is a limited amount of capital available for new courseware development. In order to get return on their investment, the schools will use the courseware they have, or are buying, for the next 3 to 5 years if they possibly can. The new developments in courseware will gradually replace less friendly or less attractive courseware. Newer approaches and techniques in courseware design will continue to be developed based upon aesthetic or cosmetic considerations. Their volume and use for the next few years will increase and then level off. Techniques that are validated in terms of learning, retention, or transfer will be identified slowly since they depend upon research studies, and there is little money available for research. Once effective procedures are found the results have to be used in the development of new courseware. In the past, this process has not been rapid and in the future it will not be substantially faster.

In terms of types of courseware, new games will be invented and will get better in that they will have more educational face validity, if not empirical validity. Tutorials and simulations will increase in use and drills will hold their own. Teachers and students like drills. Based upon what we now know, it takes a variety of modes of instruction to support a curriculum, especially when there are handicapped students in the programs who have been mainstreamed. They tend to need more opportunities to practice, and CAI is a convenient way to supplement their program. The variety of educational goals and objectives as well as teaching strategies used by teachers to educate children cannot be accomplished by only one type of courseware. Not all handicapped children are slow learners, but many do seem to need drills. Games and new drill formats that require the use of knowledge and skills will be more sophisticated in the way they process. They will process student answers and alter the nature of the drill. The new drills will be able to provide more discriminating feedback and probably will be more response sensitive; they will alter the conditions such as the amount of time allowed for response. Software programs

will be written to generate drills as needed to achieve mastery in areas other than math (e.g., Stolurow, 1963).

Do it yourself courseware. Many times the assumption is made that a teacher or the students can write CAI if given an authoring language to work with. Neither the teacher nor the child can create all of the CAI materials needed for an entire course or a curriculum. While "home grown" software and courseware will increase, schools will have to buy most of their courseware. These purchases will be increasing over the next 5 years in terms of the percentage of the school's budget for materials.

Many teachers, when asked, say they want courseware that they can modify, and more of this type of adaptable courseware will be available, but it is not the solution to a school's needs. Even with this type of aid, teachers are not likely to develop all their own courseware any more than they are likely to write their own textbooks. The time demands to do this work are substantial, and teachers are employed to teach; they are given little or no time during the school day to write.

Cognitive courseware. Rather than limit thinking about courseware to the models of it that we now know, which are drill and practice, inquiry, simulation, gaming and tutorial, it seems likely that some new forms will emerge.

More courseware will be designed from a cognitive perspective. More use will be made of graphics and animation. My guess is that perception will be given more attention. Perception can be considered interactive and integrative as a process involving schemata that are internalized by the perceiver. From this perspective, it is important for an instructional system to focus on the further development of the learner's schemata (Piaget, 1970). The design concepts for doing this will come from cognitive science, information processing, and artificial intelligence (AI) (Papert, 1972, 1980; Thomas & Schneider, 1984). From these points of view, I see courseware that is designed to make increasing use of software which modifies images and makes more use of them than is done with print. The software will be designed to learn about the learner from the responses made (e.g., Stolurow, 1975). Some of the things this might mean can be imagined. One is that the instructional programs will require more information processing in real time. As the computer delivers information to the student, it will collect and analyze more of the learner's performance data. The software will be written to look for patterns, and the response patterns it identifies will be related to expected patterns for which alternative actions will have been specified in heuristics. The instructional experiences provided will be shaped by the behavior of

the learner through the use of the heuristics built into the delivery system software. Just as a drop in the thermostat triggers your furnace to go on, a pattern of errors and/or of correct responses will lead to more examples or to more drills or to a change to a new visual, auditory, or printed display. In order to make such decisions, the computer will do more analyzing of information while it is delivering instruction. It may analyze some response patterns and it also might probe for additional information that it needs to make a decision about what to do next. The heuristics will be designed to judge or to compare response patterns, to relate these patterns to previous performances.

Correct responses will continue to be reinforced. Knowledge of results will be provided in ways that tell the learner more than that an error was made. Errors will be analyzed as they occur. The computer software will seek clues about the nature of the learner's problems, it will not just give reinforcement. Critical information about the learner is that which can be used to create a more effective learning experience. Information which clinicians discover will become useful in designing heuristics. As information is obtained from the learner and assembled, it has to be analyzed to find a recognizable pattern. The computer will have to have a repertory of actions so it can respond appropriately. In order to determine if the learner has a correct perception of a computer-presented image or is using the right principle, rule, or concept, it will have to interpret the information it has received from the learner. When responses are made, the computer program will have to determine either that the learner's responses fit or do not fit into a pattern for which implications are stored. If the responses represent a different perception, principle, rule, or concept from the one being taught, ideally the computer would be able to identify what it was, or what it might be, and then probe to narrow its search.

Some examples. Let me try to illustrate with some simple examples. In the AI, or cognitive science, model I'll use for this purpose it will be assumed that there are two perceptual processes which the system is designed to handle: (a) template matching, and (b) feature analysis.

The first process, *template matching*, has the objective of teaching the learner to recognize patterns. In short, the learner has to identify token (e.g., example of the letter *a*) of a type (e.g., the letter *a*). A CAI program along these lines might be designed as follows. If the learner had never been taught to read and did not know the alphabetic characters, the procedure would be different from that used with a learner who has schemata for some letters of the alphabet. There are many different fonts and many ways people write a letter; each is an example of the letter. A learner has to distinguish all representatives of the letter *a* from those of other letters. An approach to teaching the recognition of patterns in terms of prototypes stored in memory

is called template matching (Selfridge & Neisser, 1960; Uhr, 1963; Gibson, 1963). A new figure is identified by noting its coincidence or congruence with a basic model.

A second process to be built into the system is *feature analysis*. In teaching feature analysis, if the learner is not able to match a template, the computer might present segments of the canonical form. (e.g., Stolurow, 1961; Stolurow and Wulff, 1957).

Designing a system that would be capable of creating different perceptual experiences for different learners from a set of heuristics and algorithms is an important research effort. One type of information needed to do this is the nature of critical attributes or features to be taught so as to maximize the recognition of classes of figures such as letters and words.

Analysis and Delivery

Audit trails-diagnosis/prescription. It is useful to distinguish between the delivery capabilities of the computer and its analytical capabilities, particularly in special education. The sequential record of student performance is sometimes called an audit trail. When a particular set of experiences is common to a group of learners, the differences in their audit trails can be informative. The analysis of patterns in audit trails is an area of needed research in order to make effective use of branching and on-line decision making during learning.

An illustration from arithmetic. If, for example we want to use response information to make on-line decisions during instruction, it might be useful to consider arithmetic. The behavioral audit trail could be examined of a learner given problems in addition; the purpose is to see if there is a pattern that suggests the nature of the student's problem. To do this, it would be necessary for the software to analyze the set of responses and to identify error patterns within the set. Then it would relate an observed pattern to a set of patterns known to reveal a specific type of problem. Finding one that matches an existing pattern permits the computer to interpret it and to remediate. Still another approach would be to store routines that produce patterns and to have the computer produce patterns from these routines. Then if a pattern is a match with the student's, the procedures the computer used to produce its pattern would describe a set of steps the learner probably used.

The following four addition problems were responded to by a learner whose error pattern is readily interpreted. An analysis of four totals indicates what this learner is doing wrong. We can use this information to illustrate the approach.

A.	B.	C.	D.
46	57	98	75
89	96	28	38
1215	1413	1116	1013

This learner adds the "ones" and records the total and then adds the "tens" and records that total. One way to detect this learner's problem would be to have the computer programmed to do things like this and as it generates each answer, compare it with the student's answer. First, it would use the correct algorithm and then other algorithms, each generating a specific error pattern. When the computer's answer to each of a set of problems matches those of the learner, it can be inferred that the computer "knows" the learner's problem. The remediation routines that would be put into effect would be the next step in the process. This approach represents a paradigm shift in CAI. The system design concepts that are used are very different from those currently in use for CAI.

Either theory or data, preferably both, are needed to develop programs that identify, or diagnose, and then prescribe in real time. For basic arithmetic it would be possible to implement this approach with some success now. To do it, it is necessary to have identified different error patterns known to occur with specific kinds of arithmetic problems.

Delivery. The delivery systems for microcomputers are becoming more sophisticated. Not only are peripheral devices being added, but also CMI software is being written. This software performs a variety of functions. At present, there is no standard. CMI can be implemented using floppy disk drives but hard disk drives are being used increasingly because of storage, price, and convenience.

In a classroom or resource room in which there are mainstreamed children each of whom has an IEP, there is a need to keep records of every learner's work and to know if the IEP objectives are being met. Keeping track of individual student's progress is an added burden on the teacher. Consequently, CMI software that takes care of record keeping is a very desirable aid to the teacher.

We can distinguish two kinds of CMI systems here. One is the dedicated CMI system. This type has the capability of handling a particular set of disks, for example, a publisher's basal reading series. The management process is tied to the particular disks and the software that is part of that series. Another type is the CMI systems that are more general, or generic, in their ability to manage a greater variety of disks. Both types usually test students, record their scores, prescribe the next experience, and keep the teacher or class rosters current.

Another attractive development is the micronetwork. Several varieties exist. Most use a hard disk and are called local area networks (LANs). The large capacity hard disk makes it possible to eliminate the logistics problems of floppy disks. A relatively inexpensive hard disk with 5 to 45 or more million bytes (megabytes) of memory can be connected to as many as 64 microcomputers. The microcomputers can be distributed around a school building, but usually have to be within 2,000 feet of the hard disk drive. The CORVUS OmniNET® is one of the most widely used LANs. With it and COMPMAN (CMI software) the special student, for example, can have his or her IEP represented as a Program of Study which the teacher enters. The CMI system controls each child's access to CAI materials, so each CAI lesson is presented in the order listed by the teacher. Only the lessons in the child's program of study are available to the learner. The system allows the child access to the next CAI lesson only after the previous one is completed. As many students as need to use a program can have access to it at any time. The CAI lessons process much faster on a CORVUS OmniNET than when they are delivered via a floppy disk drive. This may be a motivational advantage as well as an advantage in increasing the student's time on task. COMPMAN also keeps a record of every child's performance. Teachers or administrators can see on a monitor, or as a printed record, the performance summary of any child at any time.

With the variety of materials needed to support the different IEPs of special children, it is becoming almost essential and more cost effective to use a LAN. When a school uses 10 or more microcomputers for instruction, the time is right to use a LAN with at least a 20 megabyte, or greater, capacity. The LAN boards are about the price of a floppy drive; the hard disk system can provide many advantages.

In the future, at least in the near term, there will be a gradual increase in the use of LANs in schools. As computer expertise grows LANs will become increasingly interesting. Similarly, CMI systems with the ability to handle IEPs will show the same trend.

IEP generators, software used by a teacher to specify a child's IEP, will become more sophisticated than they are now. The databases they use will be increased and improved. The increases in the database will follow the use of LANs with the larger memory capacity. This is important for special education because of the large number of objectives involved in their education and training. Since the LAN environment makes easier the logistics of finding objectives and the appropriate lessons, teachers will be encouraged to make IEPs more individualized. Also, schools will find it convenient to provide a richer set of alternative lessons to achieve specific objectives.

SUMMARY

The microcomputer as a technology for education, particularly for special education, has many aspects that set it apart from other media. Basically the computer is an information processor. As used in education, especially for instruction, it serves as well as supplements both intellectual, sensory, and motor systems. Its capacity and versatility have been demonstrated sufficiently within education to eliminate doubt about its ability to contribute to a number of important education processes. It has been used successfully as an aid in the development of instructional materials. It has accommodated both behavioristic and cognitive models of teaching. It can deliver instruction involving a variety of modes and media. It can be used to develop and manage individual IEPs. It can diagnose, prescribe, test, and keep records. It can accommodate to a variety of disabilities of the sensory, central, and motor systems. With this range of demonstrated capability it is clearly an important tool for education.

In fact, Bork (1980), Kleinman (1984), and Papert (1980) have predicted that by the end of this century the education of most children in the United States will take place by means of a computer. The history of the development of computers in education clearly indicates that there are still many research issues to be investigated. It also indicates that over the years the relative levels of activity for development have been higher than for research. This imbalance could have serious implications for education in general and special education in particular. Research is needed to test the validity and utility of instructional approaches.

To review the brief but active history of computers in education, CAI developed very early and its applications in special education were among the earliest. Many of the issues raised in the 1960's and 1970's are still with us in the 1980's. However, there is now a wide variety of studies demonstrating that students learn from CAI. Data show that learning effects exist for young and old, for school and nonschool related materials, and for regular and special students, both gifted and disabled.

Various forms of computer technology have been used in efforts to explore implications of CAI to reduce costs and to aid the processes of development and delivery. CAI has been on time-shared, mini-, and large mainframe computers, and on dedicated, single user personal computers. As each generation of computers has evolved, it has played a part in CAI. The microcomputer appears to provide the educator interested in instructional uses with the best set of conditions of all previous computers. The dedicated microprocessor, desk top

or lap model, is capable of relating to the broad range of learner needs in the most cost effective way. Time-sharing and author languages have not paid off for CAI. However, local area networks and general purpose high-level languages are working for CAI as relatively inexpensive, but powerful software aids for graphics, animation, sound, and the control of peripheral devices such as videotape drives, and videodisk drives. Local area networks, providing mass storage, convenience, and rapid access to software, and courseware at low cost are also giving schools the tools they need to make computers more of an aid than an add-on.

The educator is faced with an embarrassment of riches. The riches are the hardware and software that is rapidly become inexpensive enough to afford, powerful enough to provide color graphics with animation and speech in almost any area of the curriculum, and smart enough to accommodate to the instructional and problem solving needs of learners who are gifted as well as those who have severe disabilities. The embarrassment lies in our lack of empirically and theoretically supported knowledge to guide the design of efficient courseware and learning environments. The number of important questions to be answered by research is so large that the problems they pose can be solved in reasonable time at affordable cost only if they are dealt with *in vivo*. We need to create software, courseware, and systems that can capture the needed data during regular use in schools. Ideally, every school should both deliver instructional services and also function as an instructional research laboratory providing data that relate to instructional problems. Networks of schools, development centers, and educational research institutes need to be formed to see that the needed research gets done.

Since many improvements in computer technology are the result of research and development in other areas, education can reap benefits without carrying the full research and development burden on its own, except in the courseware area. However, even in this area, special education can benefit greatly from developments in software through the research in areas such as artificial intelligence and in cognitive and information sciences as well as in regular education.

By building instructional capabilities into computer-based systems, using them to teach, and then determining their effectiveness, we improve our models of effective teaching. Proceeding in this way it is possible to consistently improve the models. This approach to instructional computer technology not only lets us teach students using methods that are known to have validity, but it also permits the conduct of *in vivo* research on the instructional process, and thereby enables us to improve the effectiveness of schooling. While doing these things in on-going school settings, the concepts used to guide the instruction evolve in ways that contribute to both research and

practice. Improved conceptions of what constitutes effective teaching evolve in operational terms. In this way the computer is really an aid to our understanding of the instructional process; it is a theory machine as well as a tool for service.

With the use of the microcomputer in teaching students with disabilities, the distinction of special education from regular education starts breaking down. Individualized instruction makes this dichotomy less useful. Individualization of instruction is gradually gaining in its credibility. To a large extent this is happening because it is feasible when a microcomputer is available in the schools to aid the process. With continued use and growth in the number of microcomputers in the schools, the model set for special education by using IEPs will soon become the general practice for all students.

It would seem that in the next 5 to 10 years, barring economic catastrophe, there will be exciting developments resulting from LISP™ and 5G computers. With them will come increased knowledge about instructional and problem-solving heuristics and improved software and courseware for the special student. Besides mental aids for educational purposes, there will be improved sensory and motor aids under computer control. The fifth generation of computers will introduce a significant paradigmatic shift in education, the full implications of which have yet to be understood. It appears, however, that special education could benefit significantly from these developments.

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CHAPTER 8

The Center for Studies in Education and Human Development: A Programmatic Approach to Research in the Area of Deafness

Donald F. Moores

INTRODUCTION

In this paper I will describe the organization and some of the activities of a research center established at Gallaudet College under many of the principles to which I was exposed as a doctoral student at the University of Illinois and as a research associate at the Institute for Research on Exceptional Children (IREC). The Center for Studies in Education and Human Development (CSEHD), like the IREC, consists of representatives of a wide range of disciplines who are committed to longitudinal programmatic and pragmatic research. The structure of the center within the college permits a core of researchers to devote most of their time to research while maintaining tenure or tenure track status in academic departments. Gallaudet College itself, the only liberal arts college for the deaf in the world, provides such a

unique environment and such a specific educational mission that a model developed in a large university requires substantial modification before it can be applied efficiently. There are a number of factors that have influenced the development and functioning of CSEHD and should be borne in mind when considering the center. These factors interact in complex ways far different from those I experienced in directing a research center in education of handicapped children at the University of Minnesota. Although there are pluses and minuses and trade-offs in any situation, I believe the potential for educational research at Gallaudet is good. Following is a list and brief consideration of some of the more important factors:

1. The primary role of the college is the education of deaf individuals.
2. Faculty members must not only be knowledgeable in their disciplines but must be informed about deafness.
3. Gallaudet is a relatively small liberal arts college without the facilities that a large university has to facilitate research activities.
4. The college is legislatively mandated to conduct research in education of the deaf.

Since its establishment in 1864, the major focus at Gallaudet has been the undergraduate education of deaf students. All of the 2,000 undergraduate students have hearing losses, with the exception of approximately 50 hearing students in interpreter training programs. Hearing students have not to date enrolled in the degree programs, which range from history, chemistry, and psychology to computer science, recreation, and mathematics. At the graduate level, the majority of students are hearing, with representation of deaf students lowest in fields such as audiology and relatively high in linguistics and secondary education. With few exceptions graduate training concentrates on the area of deafness. Therefore, students go through accredited programs in specialties such as audiology, school psychology, rehabilitation counseling, and school counseling, for example, with the greatest emphasis on applications to the deaf.

Recently, consideration has been given to serving other constituencies, but it is clear that the most important constituency will continue to be the deaf. Within this framework, the main thrust of center research has been in deafness. We have been involved in research with hearing, retarded, learning disabled, and emotionally disturbed subjects, but usually as a means of comparison or generalization. The major focus will continue to be deaf individuals and their families.

A major positive influence on research and attitudes of researchers in the center is the presence and participation of highly qualified deaf

students and professionals. Because of day-to-day experiences it is more logical to think of deafness as a social condition requiring special adaptations rather than as a handicap in the classical sense. Any hearing researcher on campus with a modicum of honesty would have to acknowledge that there are deaf colleagues with insights he or she will never have and skills in manual communication which he or she will never attain.

From a research perspective, the small size of Gallaudet is offset somewhat by the level of knowledge of deafness and its implications by all faculty members. At a large university, one can always find numbers of leading figures in any field so that the potential for input and collaboration is always high in disciplines such as anthropology, sociology, psychology, and linguistics. The problem is first to interest some of them in such an esoteric (to them) field as deafness and second to get them to commit themselves to obtaining a basic understanding of the complexities of the issues. At Gallaudet the situation is quite different. Because it is a college serving 2,500 students rather than a university serving 50,000, the academic departments are fewer in number and smaller in size. However, all faculty members interact with deaf students and have practical experience with the implications of deafness, even though the majority of courses and majors have nothing to do with deafness per se. The content of an undergraduate course in physics, business administration, or math is not affected by the hearing status of the students, although accommodations may be made in teaching style and mode of communication. Furthermore, in addition to the usual teaching, research, and service requirements, tenure is contingent on passing a formal evaluation of expressive and receptive simultaneous oral and manual communication skills.

Two serious drawbacks of small size are limited library holdings and a relatively small number of graduate students available for work as part-time research assistants. Both disadvantages are offset to some extent by membership in a Washington metropolitan consortium that includes Georgetown University, the University of Maryland, Catholic University, Howard University, and American University. Although the college library has the most extensive collection on deafness in the world, library resources are restricted, as compared to large universities, and we sometimes turn to other universities in the area.

Because the only doctoral program on campus is in educational administration, the center lacks access to one of the traditional foundations of university-level research—the availability of research-oriented PhD students in a variety of fields. Similarly, because most, but not all, master's level programs are practitioner oriented and follow a "normal school" model, master's level students who partic-

ipate in research are in the minority and are self-selected. As such, they tend to be highly motivated and productive. So, because of limitations on the number of available graduate students, we have developed a core of full-time professionals to serve in research assistant, computer programming, and research associate categories. At present there are eight full-time people in these categories, four deaf and four hearing. Although the system was developed to offset the low numbers of graduate students, for purely research purposes it is probably more efficient. Most of the staff have been members of the center since its inception in 1981 so there is greater continuity and stability. As full-time members of a research center, staff members develop their skills to a higher level and have experience in several different research activities with a range of investigators. The drawback is that this arrangement reduces the training function that is usual in research centers in large universities.

Perhaps the greatest positive factor in the functioning of CSEHD is an administrative commitment to research on education and human development in the area of deafness that is based on federal legislation. The college has perceived its research mission as encompassing three general areas—prevention, cure, and accommodation. The work of CSEHD is defined as falling within the third area. As a result, the center receives continuing hard money support for research activities and is not completely dependent on outside support to carry on research activities. This support, which supplies the foundation for planning and conducting research with at least some assurance of funding over a period of years, is contingent upon satisfactory progress.

CENTER ORGANIZATION AND STRUCTURE

The Center for Studies in Education and Human Development (CSEHD) was established in 1981 following the reorganization of Gallaudet and the concentration of previously existing research units into the Gallaudet Research Institute, which had been established in 1978. The mission of the center is to conduct research of demonstrable benefit to deaf individuals and their families. It was constituted from four previously existing applied research units: Child Development, Educational Research, Mental Health, and Signed English. Prior to the consolidation, Child Development had been affiliated with the Kendall Demonstration Elementary School; the Educational Research Laboratory with the Model Secondary School for the Deaf; Signed English with the Psychology Department, and Mental Health with the Gallaudet Research Institute.

Pragmatic and Programmatic Research

CSEHD activities are most clearly distinguished by their pragmatic and their programmatic nature. A team of researchers must be able to demonstrate the potential useful application of proposed research to deaf individuals and their families before the initiation of any work. Programmatic research entails cooperative multidisciplinary work of a longitudinal nature. From the time of its constitution, center personnel have moved from a large number of small, somewhat discrete projects to collaborative programs of research that entail their cooperative efforts over longer periods of time. A program of research may consist of one or more specific projects at any time, but it must be emphasized that a program cannot consist of a string of discrete, separate projects. By definition, programmatic research involves continual interaction of multidisciplinary teams of investigators.

Center Staff

In order to fulfill its mission, the center has developed a staff drawn from a variety of fields including anthropology, education, linguistics, psychology, and sociology. During the 1984–1985 academic year, the center consisted of approximately 25 full-time members in addition to 12 student research assistants and 12 faculty members affiliated with the center on a part-time basis who held appointments in the departments of Linguistics, Education, Audiology, and Educational Foundations and Research.

Location/Space

When the center was first organized in 1981, staff members were dispersed in several different parts of the college. Pre-College Programs, which includes the Kendall Demonstration Elementary School (KDES) and the Model Secondary School for the Deaf (MSSD), agreed to allocate a cluster of 11 rooms on the third floor at KDES plus a storage room to the center. Shortly thereafter, the precollege administration approved a request to construct two additional offices adjacent to the cluster. At the beginning of the 1984–1985 academic year, the center received the use of another cluster of six rooms on the third floor of KDES, thus enabling us for the first time to accommodate all of the center staff in one location. Present facilities consist of 15 offices, two large open rooms for secretaries and word processing equipment, a viewing room, a data analysis room, and a storage room. Part-time center personnel and center affiliates also have the use of seven study carrels adjacent to one of the two clusters.

Collaboration and Affiliation

As a multidisciplinary organization concentrating on programmatic research of a practical nature, it is mandatory for the center to establish and maintain working relationships both within Gallaudet and with other colleges, universities, and school programs and agencies providing a variety of services to deaf individuals and their families. The following subsections briefly describe some of these relationships.

Departmental affiliations within Gallaudet. Seven of the center researchers also have tenure track appointments in academic departments. Six of these have been awarded tenure through their departments. Appointments are in the departments of Educational Foundations and Research, Counseling, and Linguistics. Through membership in departmental, school, and collegiate committees and councils, they participate in the faculty governance process of the college. A center member with a departmental affiliation is expected to devote approximately 85% of his or her time to research and 15% of his or her time to departmental activities. All Center members with departmental affiliations are active in academic affairs, including teaching, advising, practicum supervision, and service on dissertation committees.

Participation of Gallaudet professionals in CSEHD. Precollege and college faculty members are active in numerous research activities and there is an ongoing sharing of information and progress. Research programs in the center draw upon the special skills and interests of Gallaudet professionals who hold appointments in other units. The affiliations may involve working on research activities during summer months, providing released departmental time for research, or using research grant money to free a person's time during the academic year.

Student members. Although as previously noted the pool of potential student research assistants is limited at a small liberal arts college, the center has a policy of employing undergraduate and graduate research assistants on a part-time basis. The students bring excellent skills and a high degree of motivation to the center. In exchange they have the opportunity to participate in research of relevance to their profession and to interact with some of the most widely known researchers in the field. The number of students employed by the center varies throughout the year as a function of their availability and the needs of the center, with an average of 12 students at any one time.

Visiting scholars. In 1981, through the initiative of Dr. Kathryn Meadow, an appointment as a Visiting Scholar was made to Dr. Birgit Dyssegaard, from Copenhagen, Denmark. The plan was for Dr. Dyssegaard to become acquainted with and participate in the research of the center and to plan for future research in the area of the deaf, some of which would be in collaboration with center members. The results of the visiting scholarship were quite beneficial and the center has moved to award several other visiting scholarships. Each visiting scholar is sponsored by a member of the center, who has the responsibility for working out a plan of research and involving the scholar in center research activities, with a goal of continued collaboration following the scholar's return to his or her permanent position. To date Drs. Kathryn Meadow, Donald Moores, Carolyn Ewoldt, Thomas Kluwin and Carol Erting have acted as sponsors for one or more of the visiting scholars.

The eight visiting scholars over the first 4 years of the center's existence represent a wide spectrum of professionals both from the United States and from other countries. They are drawn from several disciplines, including departments of psychology, education, communication disorders, and special education, as well as from school programs themselves. In addition to the United States, they have come from Brazil, Denmark, Great Britain, and Israel.

Off-campus consultants and collaborators. Because the center has been charged to participate in research on a national, and even international, basis, several sets of collaborative relationships have been established, usually connected to specific programs of research. Some of these have grown out of previous collaborative efforts, either at Gallaudet or in different settings. Others have evolved through investigators with common interests sharing information through personal communication, reprints, or interaction in conventions. Still other activities have developed by means of identifying and using consultants for specific research purposes. Occasionally this has formed the basis for later collaboration. Finally, the visiting scholar program, as hoped, has provided a source of continuing collaborative research activities.

The special attention devoted to establishing and maintaining collaborative relationships has resulted in increased efficiency, lowered cost, and access to a wider range of subjects. Another factor we have had to consider is the reduced federal commitment of funding for research in special education. At a time when so many issues must be addressed—issues beyond the skills of single researchers—the sources that in the past have supported special education research do not have sufficient resources to allocate.

The consultants and collaborators are affiliated with 16 colleges and universities across the United States, including large state universities, large private universities, and small private universities. The visiting scholars who have completed their programs at Gallaudet have continued to collaborate with the center, and we are confident that long-term relationships will also be developed with the present visiting scholars.

Cooperating programs for the deaf. The center has ready access to the Model Secondary School for the Deaf (MSSD) and the Kendall Demonstration Elementary School for the Deaf (KDES), both of which are on the Gallaudet campus. The location of the center within KDES has made the relationship especially convenient and extensive research activities have been conducted in cooperation with both schools. Because the center has a mandate to conduct educational research of demonstrable benefit to children throughout the nation, it has moved to establish working relationships with programs representing a variety of educational philosophies across different settings. In the past decade, there have been substantial shifts in the type of location of educational programs serving the deaf. The trend toward integration of deaf children within public school programs was accelerated by the enactment in 1975 of Public Law 94–142, The Education of All Handicapped Children Act, which mandated a free, appropriate public education within the least restrictive environment. Whereas at one time education of the deaf, with the exception of a few large cities, was primarily the function of residential schools for the deaf, growing numbers of deaf children now are educated in public school programs within commuting distance of their homes. It is incumbent upon any research center in education and human development to investigate the sociofamilial variables associated with living at home as opposed to residential placement, as well as to conduct relevant educational research within the major educational types of settings now available to deaf students.

In addition to its special relationship with MSSD and KDES, research has been and is being conducted at approximately 30 schools and school programs throughout the United States, with representation from programs offering instruction both on a day and residential basis (see Table 1). In most cases the programs have agreed to participate in research across a period of several years.

RESEARCH ORIENTATION

Research priorities coincident with the development and education of deaf individuals are greatly influenced by the situation in general

TABLE 1

Cooperating Educational Programs for the Deaf

Name	*Location*
Day programs and public school programs for deaf children	
Kendall Demonstration Elementary School	Washington, DC
Arlington Independent School District	Arlington, TX
Arlington Public Schools	Arlington, VA
Birdville Independent School District	Birdville, TX
Boston Public Schools	Boston, MA
Callier Center for Communication Disorders	Dallas, TX
Cleveland Public Schools	Cleveland, OH
Dallas Independent School District	Dallas, TX
Fairfax County Public Schools	Fairfax, VA
Fort Worth Public Schools	Fort Worth, TX
Houston Public Schools	Houston, TX
Intermediate School District 287	Plymouth, MN
Philadelphia Public Schools	Philadelphia, PA
San Antonio Independent School District	San Antonio, TX
San Diego Public Schools	San Diego, CA
St. Paul Public Schools	St. Paul, MN
Toledo Public Schools	Toledo, OH
Residential schools for the deaf	
Model Secondary School for the Deaf	Washington, DC
American School for the Deaf	West Hartford, CT
California School for the Deaf, Fremont	Fremont, CA
California School for the Deaf, Riverside	Riverside, CA
Maryland School for the Deaf, Columbia	Columbia, MD
Maryland School for the Deaf, Frederick	Frederick, MD
Pennsylvania State School for the Deaf	Scranton, PA
Pennsylvania School for the Deaf	Philadelphia, PA
Sterck School for the Deaf	Newark, DE
Tennessee School for the Deaf	Scranton, TN
Texas School for the Deaf	Austin, TX
Virginia School for the Deaf	Staunton, VA
Wisconsin School for the Deaf	Delavan, WI

education and other aspects of special education. This is especially true at present with the widely reported trend away from residential school placement for deaf students. Therefore, recent trends in American education take on added significance with regard to applied research. I am operating under the assumption that readily identifiable recent trends in general and special education will continue. It is my perception that in the middle of the 1980's American education is at a point similar to that of the late 1950's. There is widespread criticism of the perceived failure of our public educational systems with increasing demand for fewer "frills," higher achievement standards, and tighter discipline. Within this context special education

programs will be judged successful primarily on the degree to which they close the gap in academic achievement between handicapped and nonhandicapped children. Although we as special educators may continue to attend also to sociocultural factors, we must be aware this is not part of the dominant *Zeitgeist*. In a way, we must improve academic achievement in our children merely to maintain their relative position because, it appears that the academic achievement of nonhandicapped children is on the upswing. To be judged successful, the academic achievement of handicapped students must increase at a faster rate than that of the nonhandicapped. This is a task that will challenge us and our resources to the utmost.

In the field of deafness, the challenge is especially difficult. In the past, programs have measured their success by the extent to which students acquired oral-English skills and mastered English syntax and morphology. Academic achievement, per se, has received lower priority and deaf students have less "time on task" in academic subject matter than hearing students from kindergarten and early elementary grades (Moores, 1985) through high school (Moores, Kluwin, & Mertens, 1985).

Certain readily identifiable themes have appeared in several sources recently as appeals have been made for higher standards and a commitment to excellence (Boyer, 1983; The National Commission on Excellence in Education, 1983). Recommendations from various sources include such remedies as longer school days and years, competency testing for teachers, merit pay, additional academic coursework for promotion and graduation, restructuring of teacher training, and improved classroom discipline.

Howe (1984) raised the question of what educators might do to respond to this flood of interest, this "barrage of criticism and free advice." Simply put, he asked if American education has a knowledge base from which to react to this advice and from which to generate appropriate changes. Is there any evidence, for example, that increasing the school day by one hour or the school year by one month will have a positive impact on school achievement? Can we predict the effect of testing or merit pay for teachers on student learning? Are teachers trained at the graduate level demonstrably superior to those trained as undergraduates?

Although American educational research has made significant contributions to our understanding of principles of teaching and learning, it is readily apparent that the main thrusts of traditional educational research have not addressed the areas that have been identified as most important by the public. In a very broad sense, the classical research to application model has been of limited utility in American education and—by extension—in special education.

The Acquisition of Knowledge and the Application of Knowledge

Although there are several ways of categorizing the research to application continuum, it is beneficial to bear in mind a distinction between the research process—the acquisition of knowledge—and the application of knowledge (Garner, 1971). It is necessary for the interrelationships of research and application to be carefully explicated. Isolation of one from the other is destructive. It must be emphasized that interaction is mutually beneficial to both theory and practice.

For education in general in the United States, as well as for special education, there has been a gulf between representatives of scientific (research) and service (educational) disciplines. McKenna (1973) notes:

> In the past, a great deal of education and psychological research has been done in academic isolation as a partial requirement for a degree or by scholars in their spare time from teaching, with or without funds. Such projects derived from an individual's interest in a special problem or from the availability of subjects for research. As a result, little work was done on broad issues with practical implications requiring investigations for protracted periods of time by members of different professions. This often had the effect of reinforcing inertia and insuring a kind of built-in conservatism with regard to innovation. (p. 24)

The ultimate criterion of successful research must be initiation of changes in the educational system that are of demonstrable benefit to children. A major component of any research must be careful consideration of the means by which results can be used to improve the condition of children.

The present time lag between the initiation of research activities and the adoption of changes can be attributed to a number of factors. A basic obstacle is presented by the fact that the *research* and the *adoption* ends of the continuum have been perceived as the separate domains of colleges and public schools, respectively. At the college level, the priorities and reinforcements have been arranged in such a way as to encourage behavior that tends to concentrate on research activities to the exclusion of other stages. Systems that rely exclusively on project-by-project funding reinforce this behavior. Two inevitable outcomes of the present system have been: (a) Much educational research has been conducted that is clearly irrelevant to education and (b) much clearly relevant research that has been conducted has not been of educational benefit because of the lack of mechanisms for translating knowledge into behavior.

It is clear that the research to application process occurs relatively infrequently and that much educational practice is neither theory based nor data based. The situation may be explained in part by large scale societal forces that mandate changes on the basis of political,

economic, and social developments. Educators face realities of life dictated or heavily influenced by outside forces ranging from changes in the American family, to the impact of immigration policy, to differing interpretations of the principle of separation of church and state.

In addition to perceived disjunctions between schools and institutions of higher education in the research to application process, many of the problems may be attributed to inadequate communication within colleges and across teaching and research faculty. The distinction between research and teaching is perhaps greater in schools of education than in any other field. In fact, in many places educational research may be conducted for the most part by faculty in disciplines such as psychology, sociology, and linguistics. University training programs may interact with the schools and university researcher programs may interact with the schools, but typically they do not interact with and influence each other. The detrimental effects both on research and practice are obvious, detracting from the quality of educational research and delaying the application of relevant new knowledge from preservice training to the training of teachers currently in the schools.

The applied researcher, then, must play three roles. One involves a commitment to basic, long-term examination of fundamental principles. For those of us concerned with the development and education of exceptional individuals, this includes work in the fields of anthropology, sociology, psychology, and human development. The second role is more difficult. It involves identifying areas in which well-formulated research may have a positive influence on practice. While realistically taking outside forces into account, we must keep them in proper perspective and resist a tendency to be overwhelmed by them. The third role is to interact in mutually beneficial ways with teacher trainers at the university level as well as with educators in the schools.

When I was a graduate student at the University of Illinois from 1964 to 1967, I became convinced that the most effective way to conduct both research and development activities with special populations involved reliance on programmatic and long-term efforts. I was aware of Kirk's (1964) longitudinal intervention study on the early education of the mentally retarded, and this study was the impetus for a later longitudinal evaluation of early intervention programs that I coordinated from 1970 to 1975 (Moores, Weiss & Goodwin, 1978). The work of Goldstein, Moss, and Jordan (1964) on the effects of special education was also receiving great attention during my student days. Finally, I had the opportunity to participate in the development and norming of the revised edition of the Illinois Test of Psycholin-

guistic Abilities (Kirk, McCarthy, & Kirk, 1968). This provided me with insight on the process of the development of complex assessment procedures. Because of my experiences at IREC, my tendency has been to participate to as great extent possible in longitudinal, programmatic research and to encourage colleagues to do likewise.

PROGRAMMATIC RESEARCH

We are faced with a situation in which research activities have had undeniably important impacts upon the field of special education and have significantly altered perceptions and practices. However, this influence has been uneven and the application of results has generally been unsystematic. McKenna's (1973) comments that much educational research has been done in isolation to fulfill degree requirements or by scholars in their spare time has particular relevance today, especially in view of the complex issues that are being identified. Our traditional reliance on doctoral dissertations and short-term research projects cannot provide the necessary knowledge base upon which to build programs of research.

In his series of reviews on the application of child development research to exceptional children, Gallagher (1975) constantly reiterated the tremendous difficulty inherent in attempting to master several fields. Given the complexities of the problems we face, it is unrealistic to expect investigators to have competence in more than one discipline. Clearly, the major issues facing us cannot be addressed solely by individuals working in isolation on short-term projects. The weakness of such a system has long been acknowledged and there have been efforts to remediate it, with relatively little success. For example, in 1968 Mueller discussed federal patterns of support for research in special education as follows:

> In the past, support related to the education of the handicapped was largely limited to individual project grants. Those were, generally speaking, of relatively short duration and were designed to answer fairly specific research questions. The present trend is toward support of research programs, although not to the exclusion of support for specific projects. This pattern is more efficient, allows for better integration, provides for program continuity, and institutionalizes major research efforts. . . . Integration of individual projects bearing on a given problem which may cut across various areas of disabilities and various research disciplines is another advantage of this pattern of funding. From the point of view of the researcher, the continuity provided by program support is a particular advantage. Support is for a longer period, and lapses of funding are avoided. (p. 525)

Although there has been federal support for program research with the handicapped from agencies such as the National Institute of Child

Health and Human Development and from the National Institute of Neurological and Communicative Disorders and Stroke, Mueller's predictions of more program research have not come to pass in applied special education areas.

The term *program research* itself refers to the relating of many discrete research activities to a common well-defined goal or problem area within the context of a single theme. This program provides the investigators with the flexibility to shift gears and follow up new leads or drop approaches found to be nonproductive.

By definition, programmatic research involves interdisciplinary cooperation. A sharing of knowledge and an integration of skills is mandatory. When conducted effectively, the whole of program research is definitely greater than the sum of its parts. Program research, then, is both longitudinal and interdisciplinary in nature. It is developed and accepted by a team. The results must be beneficial to all concerned. Peer review, monitoring, and feedback are necessary. Mechanisms for incorporating new disciplines and phasing out activities must be established. Programmatic research might or might not be conducted within the context of a center or of a particular institution.

PROGRAMS OF RESEARCH AT CSEHD

In the beginning, work involved identifying areas of research programs while continuing the existing research projects. It was decided that researchers would be expected to devote at least 50% of their time to programmatic research. For those with departmental affiliation, an additional 15% was allocated to teaching/advising. Full-time tenure track researchers would then have up to 35% time free for individual research or research outside the domain of the identified program areas. After the identification of program areas, the major investigators planned activities for 5 years or more around which to organize research, with the understanding that the earliest set of activities, if approved, would be supported by center funds. Once the programs were established, investigators would be encouraged to seek outside support for expanded activities. It was agreed that CSEHD research activities would not be limited to any one type of setting but could be conducted in homes, clinics, studios, and schools. School-based research takes place both within and outside of classrooms. Classroom settings include residential schools, day schools for the deaf, self-contained classes, resource rooms, and mainstream classes.

The following descriptions provide only brief overviews of current CSEHD research programs. Additional information may be obtained by contacting the center directly.

Social, Cognitive, and Linguistic Development; Family Environment; Educational History and Achievement of Deaf Children (Kathryn Meadow and Carol Erting)

One of the major gaps in our knowledge about the development of deaf children is understanding of their experiences during the first 3 years of life. Some studies of the development of deaf children and their families have been completed, but without exception they were begun when the subjects had already been involved in a preschool or elementary school program. Thus, information about the child's first years was retrospective and was screened through parents' memories from a painful period in which they were trying to procure an accurate diagnosis and effective intervention for a handicapped child.

We are beginning to collect comprehensive data from deaf children, their families, and their schools, starting at the time the child's hearing loss is diagnosed and continuing throughout the child's school life. In view of recent major changes in the educational, audiological, and medical treatment of deaf children over the past decade, this is an especially strategic time to conduct a longitudinal study. The educational implications that could follow such a study are immense.

Related to the needs in the field of deafness, in the past decade there also has been a tremendous growth of interest in and knowledge about young babies during the first year of life. This body of research has demonstrated the crucial importance of the early parent-infant interactional system as the base and context for development of social-emotional and communicative competence. In particular, the mother's (and father's) ability to set up and sustain dialogue-like interactional exchanges with the infant, and the communicative channels through which this is accomplished (e.g., gaze behavior, vocalizations, facial expressions, body movement) have been found to be very important to the infant's developing communicative skills and sense of competence. Some researchers have been interested in applying the findings to the understanding of the course of development in atypical situations (e.g., infants born at-risk, blind infants, and Down's syndrome infants). However, to date no attempt has been made to apply this research and these findings to the study of young deaf infants. Hence, the gap in our knowledge about the development of young deaf children is particularly critical as regards the nature of parent-infant interactions during the first year of life. For this reason, we have chosen to concentrate our initial efforts on early parent-infant interaction (birth–12 months) in the development of our study of deaf children and their families.

Among the research questions that are of interest to this interaction study of deaf infants and their mothers are how the different com-

municative channels (e.g., visual regard, emotional expression, body orientation and movement) develop in deaf infants during the first year, how these behavioral patterns become coordinated with the mother's behavioral patterns, and how these mother-infant exchanges contribute to the infant's developing understanding of the rules regulating the use of different communicative channels in social exchanges. We are looking both at deaf infants of deaf parents and deaf infants of hearing parents in order to determine how hearing parents (especially mothers) who may be more heavily dependent on the vocal channel of communication than deaf parents gradually accommodate, or might be helped to learn to accommodate, their deaf infant's need for visual engagement and exchange.

A Study of Developing Literacy in the Hearing Impaired Children from Ages 3 to 8 (Carolyn Ewoldt and David Knight)

The term *literacy* is used in this context rather than *reading* in order to encompass both reading and writing processes. The term *literacy* serves as a reminder of the important real and theoretical links between reading and writing and of their combined importance in theories of language and cognition.

Questions regarding literacy permeate the entire field of deafness, and most of the center investigators have been involved to some extent in research in the area. The doctoral dissertations of three center researchers (i.e., Ewoldt, Knight, and Moores) dealt with literacy and deafness. Literacy research by Ewoldt has provided the theoretical and research basis for the development of the Kendall Demonstration Elementary School Language Arts Curriculum.

A center working group produced a theoretical rationale for literacy research and proposed a study of influences on the development of literacy from ages 3 to 8. Influences to be investigated include family/community, teacher/school, and child variables as well as considerations of the nature of literacy itself. The study will run for 6 years, beginning when children are 3 to 4 years of age and starting their first year of formal schooling. The study will track the children from preliteracy activities to the point at which they should start to become independent readers.

The goal of the project is to develop a model for the acquisition of literacy skills in young children along with a research-based set of instructional procedures.

Twelve researchers around the country are participating in the study and contributing to the database. Given its scope, the longitudinal design, the participation of a number of researchers with diverse backgrounds, and the involvement of several programs for

the deaf, it is anticipated that this project will have not only a direct and immediate impact on programs for the deaf but indirect, long-term effects on existing theories of literacy and cognition as well.

Public High School Programs for Secondary School Age Hearing Impaired Children (Thomas Kluwin and Donald Moores)

This set of research activities began in the planning stage as two separate research programs; one was concerned with classroom communication as a negotiated process and the other with public high school programs. There is considerable overlap in the research questions formulated and the proposed subject populations and the same two major investigators were involved in planning on both programs. It was therefore decided to merge the two. Our research in classroom communication is designed to take into account several levels or factors, including phonological, syntactic, morphological and pragmatic considerations. Classroom communication represents a special category usually involving one adult and many children. Classroom communication may be considered a negotiated process in two senses. First, the communication must be structured in specific ways in order to be processed and understood. In planning the lesson, the teacher must deal with the content of the material, students' prior knowledge and motivation, and the language skills of the students. Second, the students themselves must have some means for influencing the flow of information, initiating discussion, and responding appropriately to the teacher's questions.

Our research in this area is designed to address two questions. First, what is the nature of the negotiation process? Second, how is classroom learning influenced by the demands of the process? Prior related research by center members has dealt with the match between spoken English and manual codes on English, teacher questioning behavior, and the effects of lesson structure on learning and retention. From these studies we have developed an integrated "process" model of communication for our research.

From our model we have developed four general classroom communication questions, which are being addressed by a series of studies. The questions are:

1. How does a student's prior knowledge influence his or her ability to process information presented in class?
2. Can improvements in ability to receive information lead to real improvements in learning, (i.e., the processing and long-term retention of information)?
3. How does the ability of the teacher to present information interact with the ability of the student to receive information?

4. How can the specificity and clarity of spoken English and manual codes on English be enhanced in the classroom?

Within the general framework of the program of research, we began with the belief that there is a need to study the transition of deaf students in public schools from elementary to secondary levels. It has been noted that as children move from elementary to high school grades in the American educational system, the most obvious difference is that the student population of secondary schools tends to be much larger than that of elementary schools. The need to provide comprehensive services leads to larger concentrations of professional personnel and resources. The necessity for specialized training causes the general elementary class teacher to be replaced by secondary subject matter specialists. The same phenomenon exists with deaf students at this age level, who also require a higher concentration of specialized services and personnel as they leave the elementary years. We need to study how two hitherto separate systems—general education and education of the deaf—can come together to provide an effective education to deaf students.

The objectives of the study are:

1. To identify and describe in detail the major public school options available to deaf students of secondary school age.
2. To describe in detail the characteristics, including family variables, of deaf students enrolled in various programs.
3. To evaluate separately for each type of program its effectiveness in meeting the educational and social needs of deaf children and their families.
4. To develop guidelines for the implementation of effective programs to meet the needs of secondary school age students in public school settings.

Three large, metropolitan public school programs participated in the first 2 years of the study and a monograph progress report has been produced (Moores, Kluwin, & Mertens, 1985). A grant from the Office of Special Education Programs has enabled us to expand this study to 15 school districts across the country, with special attention to math achievement of deaf students in self-contained classes and in integrated classes.

The program is expected to continue to 1989. Final dissemination will include:

1. Suggested guidelines for state education agencies.
2. Suggested guidelines for all large high school metropolitan programs serving the deaf.

3. Recommendations to professional training programs in deafness for
   a. education
   b. counseling
   c. interpreting
   d. school psychology
   e. rehabilitation
4. Publications in appropriate journals and presentations and workshops.
5. A textbook on secondary public high school education for the deaf.

Sign Language Variation in Context (Carol Erting, Robert Johnson, Scott Liddell, Ceil Lucas, and David Knight)

To date the set of activities within this category may be thought of as in a planning or preprogrammatic stage. Two members of CSEHD are working with three faculty members from the graduate program in linguistics to develop a series of studies of linguistic variation in sign language behavior. The issue of sign variation is of great importance today because of misunderstandings concerning American Sign Language (ASL) and the various manual codes on English.

Evidence indicates that there are different varieties of English signing. This variation appears to be multidimensional rather than undimensional, implying that there are linguistic features from both languages (ASL and English) that may be combined in a variety of ways to produce different forms of English signing. Analysis of videotaped interaction of deaf and hearing adults with preschool deaf children suggests the existence of a complex relationship between linguistic competence, setting, participants, topic, and the production of linguistic features from the two sign language varieties. The results indicated that all of the children and adults code-mixed; that is, they used targeted features of both English and ASL in their communication. Closer examination of the data revealed important differences among the adults and children with respect to the distribution of the features across the targeted linguistic categories. Thus, two adults who were both judged to be signing English with a particular child might actually have been doing very different kinds of English signing.

These observations suggest that there are probably a number of varieties of English-like signing that have been collectively labeled as Pidgin Sign Language (PSE). A pilot study attempts to examine this broad category of behaviors called PSE in order to discover some of the linguistic properties that identify English signing and also to begin

to isolate some of the properties that distinguish among the different varieties of English signing.

Toward this end, 10 deaf high school students, representing a spectrum of demographic and linguistic backgrounds, will be paired into conversational dyads and videotaped in a series of contextual activities designed to stimulate language variation.

In the final phase of the project, the stimulus tapes will be shown to 20 native signers, who will make judgments about the signing variety of each signer. Judgments will reflect the degree to which the viewer feels that the signing he or she is observing from moment to moment approaches the named criterion variety (either ASL or English). The computer will store the time codes and the values of the judgments together. Each viewer will rate some of the segments twice.

Statistical analysis of the results will provide estimates of interrater reliability and test-retest reliability. Consistent and reliable results will permit the identification of several sets of linguistic data that show particularly strong tendencies toward being rated as one variety or another. These data will be described phonologically, morphologically, and syntactically, using traditional linguistic methodology. These descriptions will provide insight into the nature of the perceived and actual differences among the commonly known varieties of signing. From the results decisions will be made concerning future research in the area.

Factors Predictive of Reading Achievement in Deaf Adolescents
(Moores, et al.)

Rather than a research program, this activity is a 38-month research project supported by the National Institute for Neurological and Communicative Disorders and Stroke (NINCDS). This project facilitates an articulation of the efforts of principal investigators from the Literacy, High School, and Sign Language variation research programs while addressing important issues in the education of the deaf.

In September 1984, CSEHD began a study of factors predictive of reading ability of deaf adolescents drawn from two populations. The first consists of deaf children of deaf parents and the second of deaf children with hearing parents, both groups of whom have been in total communication programs since at least age 4. The purpose is not to compare the groups but to identify within each group those factors that could contribute to the development of effective literacy skills.

The first phase of the study is concerned with developing appropriate evaluation instruments. Following that, a pilot study of 10 children between 16 and 18 years of age from each category will be

conducted. Two separate studies of students 16- to 18-years old will then be conducted. Group 1 will consist of a minimum of 65 deaf children of deaf parents and group 2 will consist of a minimum of 65 deaf children of hearing parents who have been in total communication programs. Final results will be used to provide guidelines for educational programs. The Central Institute for the Deaf will conduct a similar study with a third group—deaf children in oral programs through age 12. The following schools will participate in the total communication and deaf children of deaf parents studies:

American School for the Deaf, West Hartford, CT
California School for the Deaf, Riverside, CA
California School for the Deaf, Fremont, CA
Maryland School for the Deaf, Frederick, MD
Model Secondary School for the Deaf, Washington, DC
Texas School for the Deaf, Austin, TX

The principal investigator, Moores, has responsibility for the management of the research and will work in cooperation with specialists in the following areas:

Reading and Writing Assessment—Carolyn Ewoldt (CSEHD) and Thomas Kluwin (CSEHD)
Spoken and Signed Discourse—Robert Johnson (Dept. of Linguistics) and David Knight (CSEHD)
Speech and Hearing Assessment—Patrick Cox (Dept. of Audiology)
Research Design and Statistical Analysis—Steven Wolk (Dept. of Ed. Found. & Research) and Donna Mertens (Dept. of Ed. Found. & Research)

Mental Health and Deafness (Barbara Brauer)

Research on mental health and deafness represents another preprogrammatic or planning stage. The original plans called for a core of three doctoral-level investigators to develop a program of research in mental health. So far, budget restrictions to date have not allowed this, and Dr. Brauer alone has primary responsibility in the area. While explaining possible collaborative studies with colleagues in the Department of Psychology and the Center for Assessment and Demographic Studies at Gallaudet, Dr. Brauer has begun pilot research on depression in deaf individuals and the potential benefit of a relatively new psychotherapeutic approach.

The sources of distress for disabled individuals are often not physical hindrances but unsuitable interpersonal relations. Increasingly, research has shown deaf individuals to manifest certain subclinical expressions of depression, namely low self-esteem and external loci of control.

Depressive disorders are found to be one of the most prevalent of major mental illnesses. Major research programs have made depression a target for study (e.g., NIMH Treatment of Depression Collaborative Research Program, Boston-New Haven Depression Research Project at Yale University, University of Pennsylvania). Mental Health and Deafness research at Gallaudet will use current developments in the diagnosis and classification of depression and in promising new psychological approaches for its treatment.

The psychosocial approach for an initial study is the Short-Term (16-week) Interpersonal Psychotherapy of Depression (IPT) developed by the Boston-New Haven Collaborative Depression project. IPT is derived from a number of theoretical sources having their emphasis on the individual's current psychological and interpersonal experience. Mastery of current interpersonal situations is stressed as an important social-psychological component in psychotherapy. Emphasis is on the social roots of depression and the need to attend to the interpersonal aspects of the disorder.

The overall research plan calls for three phases. Phases I and II constitute the pilot aspect of this research effort and include the training of four therapists in the IPT approach. Phase III will be the outcome study, in which outcomes of the IPT treatment of deaf depressives will be studied after these same four therapists have completed their training and received their IPT certification.

Individual Research Activities

Several center members participate in and are planning research projects separate from ongoing programs of research. The projects are conducted both with Gallaudet faculty and with other colleagues. Specific topics include onset of deafness in adulthood (Meadow), program evaluation in Brazilian schools for the deaf (Moores), analysis of South American sign languages (Erting), communication behaviors of deaf adults (Moores), and telephone transmission of visual signals (Knight).

SUMMARY

Special education research must be both programmatic and pragmatic. The issues involved are so complex that they must be addressed by multidisciplinary teams of research over extended periods of time. Traditional reliance on doctoral dissertations and individual researchers working in isolation has produced only limited benefits compared to the impact of longitudinal programmatic research in special education pioneered at the Institute for Research on Exceptional Children (IREC). Of equal importance to the need for interdisciplinary prag-

matic research is the need to develop strategies by which the results of research can be applied in the classroom. This calls for the establishment of effective channels of communication between researchers and practitioners. Finally, special educators—whether in research, training, or direct provision of services to the handicapped—must be sensitive to changes and trends in society and education in general, so that we can respond to developments while keeping faith with the enduring needs of handicapped individuals.

The structure and functioning of the Center for Studies in Education and Human Development at Gallaudet College have been greatly influenced by my experiences as a graduate student at the University of Illinois and as a research associate in IREC. The special nature of Gallaudet College and the population it serves necessitates unique structures and operations. However, the fundamental requirements for successful applied research remain the same—a multidisciplinary core of highly skilled professionals with adequate support working cooperatively on well-defined programs of inquiry.

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CHAPTER 9

Leadership Training Models for the Future

Clifford E. Howe

Leadership is generic. No discipline owns the best conception of it. Rather, there are a number of models for leadership that work in some settings and not in others. It's important to recognize this because ideas for special education leadership need to draw from areas outside the field. It also needs to fit into general administration—if one believes, as I do, that special education will always be a subsystem of the total education enterprise and should be integrated with it.

Special education is, and will continue to be, a numerical minority in the total system; it is directly responsible for no more than 10% to 15% of the pupils in a school system. Almost three fourths of these pupils are mildly handicapped children who will spend at least a part of each day in regular classrooms. Yet we continue to perpetuate a dual model in which special educators run programs for the handicapped and general administrators manage the rest of the school system. It is time that special educators get back on board the "education train" and stop trying to run on a separate track. To the extent that special educators could become the engineers on some of the runs, they might be more likely to influence where the education train goes.

I express appreciation to my colleague and former student, Dr. Austin Mueller, for much of the content of this paper.

It is useful to look at leadership in special education as consisting of a broader group than just the administrators of such programs. Certainly those who work in university settings, as well as in major organizations such as CEC, have had a significant impact on instituting change and will continue to do so. Various writers have spent time trying to differentiate among leaders, managers, and administrators, but it has never seemed to me that it has made much difference. My concept of leadership turns on a person's ability to influence or direct a group with whom he or she is interacting and involves three basic elements: people, processes, and systems (Hanson, 1979).

Some preliminary work on special education leadership theory has been done, principally by Burrello and Sage (1979). They believe that the social system perspective as originally developed by Getzels and Guba (1957) can incorporate the needs for special education leadership. From this perspective, special education is seen as a subsystem of general education and both are influenced by various publics in the larger society. Burrello and Sage also see merit in studying leadership style using the model of situational leadership theory developed by Hersey and Blanchard (1977). With this background, it might be useful to take a quick glimpse at the historical development of current leadership theory. Most of it has come from fields outside of education. A highly valued source that traces this movement is Stogdill's *Handbook of Leadership* (1974).

TRAIT THEORY

The first major movement was labeled classical or trait theory and was popular during this century until the 1950's (Owens, 1981). It had its roots in the screening and selecting of military personnel during World War I. Later the ideas were adapted to the personnel testing movement in industry and its search for leadership characteristics. One of the first to publish data regarding leadership traits was Nutting (1923). The contention was that a set of personal characteristics and inner traits differentiated effective from ineffective leaders. Leaders were thought to be born, not made. They were endowed with natural psychological traits for leadership. The "great man" idea was an embedded belief. Hundreds of studies were done, and researchers kept adding traits to the list. It finally became apparent that what included everything discriminated nothing. Only three traits seemed to rank high—intelligence, initiative, and responsibility—and they weren't consistently ranked highly (Stogdill, 1965). Trait theory hasn't died; it just can't be, or at least hasn't been, validated. On an intuitive level, the idea that traits are at the very root of human personality remains a popular notion.

BEHAVIOR THEORY OF LEADERSHIP

Leadership behavior theory gradually replaced trait theory as a basis of approach. Researchers began to look at the importance of behaviors and personal interaction. A major group of investigators at Ohio State University did extensive research during the 1950's and the 1960's. Halpin (1957) conducted studies relating behavior and effectiveness in military situations. Stogdill (1965) found consideration by the supervisor to be positively related to group motivation. This behaviorist movement culminated in the delineation of a dozen or so styles that were finally reduced to two. Various labels have been attached to these two polar styles—democratic vs. autocratic; structure vs. consideration; task-motivated leaders vs. relationship-motivated leaders, and McGregor's notions of theory X and theory Y (and now theory Z from Japan). Implicit in the behavior theory of leadership was the idea that being democratic was better than being autocratic but the data didn't always support it. Sometimes a group felt better under democratic leadership but produced more under more structured leaders. Thus, behavior theory began to fade in the 1960's because a leadership style that worked in one setting seemed to fail in another.

CONTINGENCY LEADERSHIP THEORY

Although there was considerable overlap in time, the behavior theory of leadership gave way in the 1970's to an increased interest in that strand of open systems referred to as the contingency theory of leadership.

Fiedler (Fiedler, Chemers, & Mahar, 1977) is the major person identified with contingency theory. This theory states that leadership style has to be compatible with its context and the "leader match" concept. The leader may have either a task-oriented or a relationship style. Either style will succeed, depending on such other factors as the relationship of the leader and the members, the structure of the tasks to be accomplished, and the formal power of the leader's position.

The jury is still out on how well contingency theory works. A major unanswered question is whether the leader can change styles in situations that call for different approaches. Fiedler seems to believe that a leader cannot make dramatic changes from one style to another. Others are working on notions arguing that the leadership style of an individual can be varied as situations within the organization change.

In closing this brief historical review, it is interesting to note that the whole thrust in contingency leadership, which is currently in favor in industry and the public sector, has been almost totally ignored in

education. However, educators have come to realize that their field is no longer (if it ever was) a closed system in which they have major control of their destiny. Instead, they've accepted the notion of education as an open system in which decisions are strongly influenced by outside pressures such as politics, legislatures, unions, the courts, and a host of others. From this thinking has developed the idea of the chief executive functioning as coordinator of a management team.

In sum, I would conclude that social scientists have not yet developed a comprehensive theory of leadership. Maybe they never will. In the meantime we do have some knowledge of leadership. What can we in special education use from this knowledge in considering leadership training models in the future?

I think we could say that special educators are in low control of the total educational system. Many of the changes that have taken place over the past 10 years have been from the top down—what is often referred to as "enforced change." This has come from both P.L. 94-142 and subsequent court decisions. According to leadership theory, only a minimum level of compliance can be expected to occur under such conditions. Berman and McLaughlin (1975; 1977) studied the difficult process of moving from the beginning of a new practice through its actual implementation. A process of "mutual adaptation" must take place between the new program and local norms. This suggests that the federal intent will have to be modified in practice at the local level if real implementation is to occur. In order to move beyond compliance to acceptance of the full meaning and spirit of appropriate education for all handicapped children, we need to create a process of planned change. Only such a process will bring about a truly increased level of acceptance by all educators of the values we hold as special educators.

I don't see this coming easily. In order to achieve it, I believe we need to modify our views about regular school principals and stop behaving as though they don't understand enough about special education to administer programs in their buildings or to evaluate special education teachers effectively. Kirst (1979) contends that the building—not the school district—is the optimal unit for change to take place most effectively. With the current move toward integrating the handicapped into regular schools and classes, conflicts arise as to who is in charge of handicapped children within the building. Many regular principals continue to profess a lack of the training or experience needed to provide competent leadership, and they are glad to turn programs for the handicapped over to us. An equal number of principals argue that different schools have different needs and that the principals should have the freedom to develop those programs that best meet the needs of their clients, including the handicapped.

As different children and programs appear in the regular schools, we also need to adjust our typical views of the role of the building administrator. Principals may be unsure about what they should do. One of our leadership goals might be to teach these regular principals whatever it is that we do know, and then have them do it. This process would take some time, but it could be achieved, I believe, if both regular and special education administrators really wanted it to happen.

Perhaps one of our objectives for this decade should be to encourage special educators to seek careers in general administration. Several of my former students are now school superintendents or building principals, a strong position from which to advocate for the handicapped. Such a strategy also eliminates the need to retrain an administrator who may have little background or interest in the handicapped.

These views were reinforced recently when I read a report by a group from Vanderbilt-Peabody (Hargrove et al., 1983). In their case study of selected principals in a large school system, they found considerable differences from building to building in the way handicapped children were integrated into the regular classroom. These differences were judged to be rather directly related to the leadership of the individual principals involved. And this was not because the students attending the schools were different. Effective elementary school principals were democratic but provided strong leadership—they were labeled as authoritative democrats. They were successful in achieving a high degree of teacher interaction in their buildings that was directed toward meeting the goals of all students in the building. The teaching staff, both regular and special education, had jointly assumed the responsibility to provide the most appropriate education for every child in the building. The report tends to confirm the conventional wisdom that the principal is everything. It should be noted, however, that the report also found a few high-performing schools whose principals could not be considered the key to innovation. In these instances, it appeared that lead special education teachers or resource room teachers had taken on the extra responsibilities for implementation of P.L. 94-142.

A second example of a planned change process could be tied to the recent work of Madden and Slavin (1983) whose review of the research on mainstreaming found that at least two approaches in regular classrooms showed promise. Both approaches—individual instruction and cooperative learning—involve substantial change in curriculum approach in regular classrooms. Such curricular changes would have to be endorsed and promoted by regular educators. Also, for an innovation to be widely accepted by an organization (in this

case the regular school system) it must be demonstrated that the intervention is not harmful to regular students.

As a note of caution, I'm not particularly endorsing cooperative or individual learning for all students as an approach that will solve our problems in mainstreaming. We've all been through a dozen "new ideas" that were going to "cure the ills" of the handicapped, and none of them did. I've frequently commented that we seem to do more preaching than teaching in special education, but this is not intended to denigrate our efforts. What we have done very well is to focus society's attention on the need for more humane treatment of the handicapped. As Hanson (1979) says, "Quite possibly one of the problems reformers have is that they believe they understand more than they actually do" (p. 294). On the other hand, progress comes from the continuous trying and discarding of new approaches, and I am cautiously optimistic about any instructional model that would diminish direct competition among students—handicapped or not—in the regular classroom. Most handicapped children do not fare well under conditions of intense competition.

It appears, at least on an experimental basis, that academic achievement is not lowered and that social acceptance is improved under cooperative learning models in the elementary schools. As Gallagher and Simeonsson (1982) recently noted, "Part of the answer to effective placement of handicapped children of a mild classification appears to be the improvement of the normal education setting" (p. 312).

The last suggestion I would make regarding leadership directions we may take argues for us to pay more attention to the best that we do and to try to determine why it is so. I was recently reminded of this when reading the Kavale and Glass (1982) meta-analysis of efficacy studies. From looking at the standard deviations of their effect sizes, it seems that some treatments are very effective and others do not fare very well. I should also refer to a current unpublished study in which I am involved of a select group of superior special education resource teachers; our preliminary results seem to look much like some of the data from the teacher effectiveness studies of the 1970's as related to teaching low-socioeconomic students. The teachers in our study appear to be very highly organized, to set high but reachable standards for themselves and their students, to be firm but caring, and to have excellent relationship skills in working with regular staff. A sidelight of the study that I found interesting was that these teachers appear to violate many of the state and P.L. 94-142 rules, in that they work with many children in their schools, be these children identified as handicapped or not. The emphasis is on instruction and relationships and not on formal identification. There has to be something wrong when one sees (as was true in a recent Colorado study) that

more than half of the money available for learning disabled students was spent on identification practices prior to receiving any instruction (Shepard, 1983). Somehow, our system of financing needs to be revised to take the profit out of identifying the handicapped.

In summary, it is my hunch that in the next few years our educational leadership should shift its focus more to a planned change model such as that espoused by open systems theory and/or organizational development advocates. Whether or not this will work has to be considered speculative. Hargrove and his associates (1983) believe that there is enough evidence in the literature to support a planned change model of moving P.L. 94-142 from a compliance to an implementation level. Using a technique called "mapping backward," an effort is made to determine what is truly required at the grass roots level in order for an innovation law such as P.L. 94-142 to be accepted locally. After this has been assessed, these data could provide the basis for determining what needs to be done at the state and federal level. Critical ingredients thought to be important at the local level include (a) investment of time by key management at the top level of a school district; (b) commitment from top management to the value of P.L. 94-142; (c) organization of a systemwide implementation group composed of influential regular administrators and special educators whose mission is to see that quality implementation of the law occurs; (d) use of high performing schools' staff to upgrade the quality of implementation in lower performing schools; and (e) setting local deadlines for accomplishment and holding to them. In order to have real impact on the total system, it would also be to our advantage to train special education personnel to accept responsible positions in regular education to a much greater degree than we have in the past. As the futurist Snyder (1982) has observed, "People like and welcome change, it's institutions that don't."

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CHAPTER 10

A Proposed American Academy of Scholars in Education of the Handicapped

Lloyd M. Dunn

It is a privilege to present a future-looking paper and to participate in paying homage to Samuel Kirk at this, his 80th birthday celebration. We have shared a great deal of *aloha*—and I might add, professional and social experiences—since I first came under his tutelage at the University of Illinois in 1950. It has been a rewarding 34-year association. Even though Orville Johnson is his first doctoral graduate, I am proud to be his second.

More than any other special educator, Dr. Kirk has been recognized internationally for his achievements. Why has he been so respected and admired? In my view, it is because he stands alone, above the rest of us, for his scholarship and intellect, as well as his personal warmth. How good it would be to have more people in our field approach his stature!

Since I believe nothing would honor Sam more than for us to find ways to raise our professional standards, I want to rough out for you an idea I have been mulling over for some time. It is a proposal for

This printed paper is a revision of a draft presented at the Kirk Colloquium. It reflects extensive input by many participants and others whose contributions are hereby gratefully acknowledged.

the establishment of another organization. I can hear your reactions, and rightly so. We have too many splinter and competing groups already. But please hear me out. For want of a better name, I'll call it, tentatively, "The American Academy of Scholars/Doctors in Education of the Handicapped," or, a bit more briefly, "The American Academy of Scholars/Doctors in Special Education." I'd be inclined to avoid the title of "American Academy of Special Education Scholars" because of the negative connotations associated with its acronym. More seriously, the actual title is a matter that requires careful consideration, as do many other issues I will raise in this presentation. Now permit me to develop the rationale for my proposed academy.

BACKGROUND

First, I'd like to present a bit of background on how I came to believe there was a need for this academy. It is my contention that doctoral programs in special education—the source of essentially all faculty for the field—have gotten out of hand: There has been proliferation in abundance, but where is the consistent quality? That is my beef.

Let's examine the *quantity* issue first. Although the focus in this discussion is on doctoral programs and persons who obtain the doctorate, Tables 1 and 2 are included here to provide a larger picture on how programs for the preparation of special education personnel at all levels have expanded in U.S. institutions of higher education in the last 30 years. Only a rough comparison is possible because the training of speech pathologists was included in 1953–1954, but not to the same degree in the current surveys. Nevertheless, it is readily apparent that there has been a 500% increase in the number of colleges and universities engaged in special educator preparation.

As for the doctorate, in 1953–1954, only 12 universities claimed to offer a program at this advanced level in areas of specializations other than speech pathology. Of the 208 full- and part-time doctoral students reported to be enrolled, only 81 were in areas other than speech, and 43 of this 81 were at Teacher's College, essentially all part-time enrollees. And, of the 45 students awarded the doctorate throughout the nation that year, only 10 were in areas other than speech pathology.

Today, the picture is quite different. In 1982–1983, 59 institutions reported 1,269 doctoral students enrolled. Some 199 PhDs and EdDs were awarded in special education in the previous year.[1] The latter

[1]This is not the complete picture on people in special education obtaining doctoral diplomas. Reported here are only data on colleges and universities that are members of the American Association of Colleges for Teacher Education, with programs approved by the National Council for Accreditation of Teacher Education (NCATE). More

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TABLE 1

Number of Programs, Levels of Training, and Faculty Members in Colleges and Universities of the USA with Programs for the Preparation of Special Education Personnel for 1953–1954 Versus 1982–1983

	No. of Colleges & Universities Training Special Education Personnel				*Total No. of Full-time Faculty*
Academic Year	*Total No. of Institutions*	*Doctoral Level*	*Master's Level*	*Undergraduate Level*	
1953–1954[1]	122	25(12)[2]	34	94	253
Currently[3]	698/495[4]	59	266	319	2,305

[1]From Mackie and Dunn (1954), with about half of these numbers representing programs in speech pathology only. So for an approximate rough comparison with today, divide this line of figures by two.

[2]Of the 25 institutions offering the doctorate in special education and/or speech pathology, only 12 were in special education.

[3]From Geiger (1983) and U.S. Department of Education information (Will, 1984), with most of the data from 1982–1983 but some from 1980–1981 and 1981–1982. Most programs in speech pathology solely have been excluded.

[4]While 698 institutions of higher education reported having training programs for special education personnel, only 495 of these submitted statistical information.

TABLE 2

Annual Student Enrollments and Degrees Granted by Colleges and Universities in the USA with Programs for the Preparation of Special Education Personnel for 1953–1954 Versus 1982–1983

	Enrollments			*Yearly Degrees Granted*		
Academic Year	*Doctoral Level*	*Master's Level*	*Undergraduate Level*	*Doctorates*	*Master's Degrees*	*Bachelor's Degrees*
1953–1954[1]	208[2]	1,397	2,996	45[3]	516	988
Currently[4,5]	1,269	40,341	44,025	199	20,538 (combined total)	

[1]From Mackie and Dunn (1954), with about half of these numbers representing programs in speech pathology only. So for an approximate rough comparison with today, divide this line of figures by two.

[2]Of this 208, only 81 were in areas of specialization other than speech pathology.

[3]Of this 45, only 10 were in areas of specialization other than speech pathology.

[4]From Geiger (1983) and U.S. Department of Education information (Will, 1984), with most of the data from 1982–1983 but some from 1980–1981 and 1981–1982. Most programs in speech pathology solely have been excluded.

[5]While 698 institutions of higher education reported having training programs for special education personnel, only 495 of these submitted statistical information.

figure represents about a 2,000% expansion in 30 short years. Few would argue with my contention that there has been proliferation in abundance in recent years.

As for my proposition that there is often a lack of quality today in doctoral programs of special education, this is more difficult to document. The Council for Exceptional Children conducted an ERIC search for me over 18 years of professional literature on the topic of teacher education in general and of special education in particular. An extensive annotated bibliography resulted. In studying it, I came to this conclusion: professors and others have no hesitancy about studying teacher competence, but there appears to be a taboo against research on college instruction. In this extensive 18-year search, not one report was unearthed on the proficiency of university professors in education or any other field. So hard data are lacking to support my position, but here are my arguments:

First, there are my own personal experiences. I've now spent 30 years as a college instructor, much of it devoted to doctoral training. Generally, I have noted a downward trend in standards over time. The sharpest drop occurred in the 1960's and 1970's, at the height of the permissive era, when the emphasis was on "doing one's own thing." And, in my view, we have not yet recovered from this onslaught on scholarly toughness. Special education was simply part of the societywide malaise.

Second, and elaborating on the first argument, the quality and quantity of research reports in the literature has not increased at anything like the 2,000% rate to match the rate of awarding of doctorates in special education. Certainly our knowledge base is growing, but at a snail's pace. One must ask: Where is the body of productive scholars in the field?

Third, many of the better-known professors of special education confide to me that too many doctoral programs are funded by the federal government and that strong sets of standards for this funding are not employed. What is the current situation? In 1983, an overall amount of $49,300,000 was awarded by the government for special education personnel development (Will, 1984). About 10% of these

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(continued from p. 163)

and more unearned doctorates are picked up from nonaccredited paper mills, probably mainly by school administrators who do not attempt to become full-time university or college faculty members. The sale of these bogus diplomas has become a big business that is getting bigger. Others obtain doctorates outside of special education, usually in administration and supervision at NCATE accredited institutions, with minors in special education. Further, but less recently, many faculty in special education major in psychology. How knowledgeable they are in special education is an open question. Perhaps they are more scholarly than special education majors. Another source of college professors in special education are people who take postdoctorates in the field.

funds, or roughly $5 million was used to support doctoral and postdoctoral level programs. If I have interpreted correctly the excellent and detailed data sent to me by the U.S. Department of Education in August 1984, some 466 doctoral students in special education were receiving federal government financial assistance. There were 84 projects awarded to support doctoral and postdoctoral level programs, but this does not mean that 84 different institutions of higher learning received grants. Nevertheless, it appears that the federal dollars were spread rather widely and thinly across the country, probably in part because of political pressure. My educated guess is that essentially all 59 NCATE-accredited colleges and universities now offering the doctorate in special education receive some federal funds to support their programs. I argue that this is far too many.

As for standards used to determine which institutions and doctoral students receive federal support, the U.S. Department of Education (1984) recently published a set of regulations that was made broad and general enough to cover all types of personnel training in special education. These regulations do not deal specifically with doctoral level programs. As for standards, the U.S. Department of Education (Will, 1984) stated that the institution must demonstrate that state and professionally-recognized standards will be met. But, to my knowledge, no state has established standards at the doctoral level. They confine their attention to teacher certification and accreditation of teacher training programs. And the newest statement of professional standards of The Council for Exceptional Children (Heller, 1983), while a beginning, has only one standard specifically on doctoral degree programs. It states:

> Standard: No less than one full-time qualified doctoral faculty member shall be provided for each specialty area (as defined by the institution) offered in special education. In addition, sufficient faculty shall be provided in those areas that directly relate to, or serve to augment the specialty area programs. (p. 19)

As I interpret this standard, a university could meet it with only one faculty member in special education if the degree is offered in one narrow area of exceptionality. If so, my reaction to this feeble attempt to set standards is this: Why dabble? Unless the job is going to be done thoroughly and well, why even allude to standards for the doctorate?

Clearly neither the federal government, the state government, nor CEC is providing quality control over the doctorate in special education. As a result, I believe I have sufficient reasons, albeit based on circumstantial evidence rather than hard data, to (a) bring the matter to the attention of the field, (b) propose that we attack the problem,

and even (c) suggest a possible solution. However, some might argue that the trouble does not lie primarily with the quality of doctoral programs, including faculty, but with the low scholastic aptitude of the students they serve. In short, programs of instruction can't be expected to make "silk purses out of sows' ears." Others will label this position as passing the buck. There is some evidence on this issue because scholars have not been hesitant to study teacher competence. Repeatedly it has been found that college-bound education majors, overall, have lower verbal intelligence scores than those electing any other area of study (and there are dozens of them), with three exceptions—those choosing to major in ethnic studies, home economics, or a trade (Feistritzer, 1983). And the trend line of Scholastic Aptitude Test scores has been downward for at least a decade. In short, as a group, today's students who elect to become teachers are among the dullest. As for the academic ability of persons entering and remaining in special education, there is less evidence. But, with information from only one institution, Frank and Keith (1984) provide helpful hints. At least at that one university, special education majors appear to be somewhat brighter than education majors generally. But after 5 years of teaching, a substantially greater proportion of the more able graduates had left the profession. If this is a general pattern across the country, one must worry about the scholastic capacity of the pool from which students are selected to pursue advanced graduate study, including the doctorate. So, on the issue, part of the problem may be the limited intellect of graduate students. Given the reality of the situation, this possibility suggests the need to be highly selective in choosing advanced graduate study enrollees, perhaps recruiting from related areas, and having particularly strong courses of study and faculty to overcome student deficiencies.[2]

ALTERNATE SOLUTIONS

If you accept my premise that there is a great need today to strengthen doctoral training programs in special education, the question arises of how best to proceed. Some would argue that lack of high standards extends downward from the doctorate to the master's and bachelor's degrees, and a frontal attack is needed at all levels. Probably so, but I suggest we need to establish priorities and select the level that will result in the largest gains over the long run. When something is wrong with a business—and higher education *is* big business—it is my belief

[2]A number of faculty indicated to me recently that they cannot be selective in admitting students and retain their doctoral programs, and that conditions are getting steadily worse. This information suggests that there are too many programs scrambling for too few capable students.

that one starts at the top to correct matters. This is the reason I am suggesting that an academy be created to focus on the doctoral level, at least at the outset.

Having elected to begin at the top, two alternate procedures for raising standards become available. One is to apply them program-by-program; the other is to apply them individual-by-individual. I would argue that the academy should assume both responsibilities. Let's briefly examine each of these roles.

The *program-by-program approach* has been the strategy of choice in education for over 50 years. What is it and has it worked? As most of you know, the paramount national accrediting agency in teacher education is the National Council for Accreditation of Teacher Education (NCATE), which is the only national accrediting agency recognized by the U.S. Department of Education. Its governing council consists of 26 members—2 public representatives, 8 appointed by the American Association of Colleges of Teacher Education (AACTE) and 8 named by the National Education Association (NEA), plus 8 members, each representing 1 of 8 professional organizations in education, one being The Council for Exceptional Children (CEC) (Lilly, 1983). The decision to apply for accreditation is voluntary. Currently, 550 of the 1,287 colleges and universities in the nation operating teacher-training programs are accredited by NCATE, or about half. The 550 tend to be the major ones said to be preparing about 87% of the nation's teachers and other school personnel (Feistritzer, 1984a). Feistritzer (1984b) recently evaluated teacher education nationally and concluded that up to one-half of the 1,287 institutions with such programs should be shut down because they are little more than "diploma mills." It would be interesting to know how many of the NCATE-accredited institutions she relegated to this status.

Currently, NCATE accredits by a two-step process. First, institutions go through an extensive and intensive self-examination leading to an elaborate written report. This phase has the advantage of forcing faculty members to get their act together and to engage in self-improvement. The second phase consists of site visits and reviews leading to an initial 7-year accreditation, with a "minivisit" after 5 years to determine whether the institution should undergo a full-term visit in the 7th year or have accreditation extended to 10 years. How has this system been working? Not at all well judging from recent reviews of the process, the weaknesses identified, and the changes proposed (see Lilly, 1983). AACTE itself acknowledged that there has been an erosion of confidence in NCATE'S capacity to do the job. Major concerns include vague and minimal standards, peer review by inadequately trained visiting teams, and the control focus on overall lower-level training programs for regular classroom teachers, which masks strong and weak programs in specialties like education of exceptional

children, especially at the doctoral level. Presently the NCATE procedures are being redesigned in an attempt to overcome these and other weaknesses but, in my view, it is unlikely that major improvements will occur. I feel the wrong sponsors are going about the job in the wrong way so far as doctoral training in special education is concerned. However, the need for program-by-program accreditation exists, and will continue to exist. But we special educators should not look to NCATE to do our job for us. I'll return to this topic later.

As for the *individual-by-individual approach* to setting and maintaining standards, historically it has been used primarily by state governments in issuing teaching certificates. Institutions of higher education also adopt this approach in selecting and hiring individual faculty members. But why haven't teachers themselves engaged in setting standards for admission and retention of persons permitted to practice in the field? Instead, such trade unions as NEA and the American Federation of Teachers (AFT) have admitted to membership anyone with a valid state-issued teaching credential. Further, the majority of CEC members have never favored scholarly standards as a criterion for membership. Incidentally, I am aware of the strong arguments for this posture. Recognizing these facts, I asked myself the key questions: "What is a profession, and is education, in general, and special education, in particular a profession?" This led me to the library where I found several books with about the same title, including *Education as a Profession*, by a former associate of ours here at the University of Illinois, namely Mike Lieberman (1956). As a group, the authors of most of these texts arrive at the same conclusion, namely that *education is not a profession because its members are not organized to set standards for admission and retention in the field*. More recently, Birch and Reynolds (1982) examined the literature and reached the same conclusion for special education. This is a key idea, so let me paraphrase from Birch and Reynolds: *With a profession, the already-qualified members prescribe and apply standards governing admission to their group. Furthermore, a licensing body exists to enforce these standards. It is governed by the profession itself.*

THE PEDIATRICIAN AND OTHER MODELS

The same basic conclusion reached by Lieberman (1956) about teachers, and by Birch and Reynolds (1982) about special educators caused me to raise these questions: How have other groups of persons, who are engaged in callings requiring specialized knowledge and skills acquired through long and intensive academic preparation, organized themselves? Which of them deserve to be called professionals, according to the Lieberman/Birch and Reynolds criterion? How are the

groups with high status as professions, such as doctors and lawyers, for example, organized to prescribe and apply standards for admission and retention to their fields? And which professions do this best?

After an all too brief review, I found that, essentially, all well-recognized groups of professional people have a well-defined system for controlling membership, and thus meet the Lieberman/Birch and Reynolds criterion. In fact, educators appear to be about the only group that has delegated this responsibility to others.

As part of this proposal, I recommend that a wide range of professional organizations be studied in search of the worthy features they use to control membership. For example, we could learn much from the organization of the group that has the closest affinity to ourselves, namely the American Psychology Association (APA). APA has focused on only doctoral personnel, as I am proposing we do, at least at the outset. (School psychometricians, with less than a doctorate, are not admitted; as with public school teachers, state governments license them.) APA both accredits doctoral training programs and licenses/certifies the competence of individuals who have obtained the doctorate in their areas of specialization. Courses are available, by both independent study and through seminars, to prepare for the licensing examinations.

Another group closely associated with special education is the American Speech-Language-Hearing Association (ASHA). ASHA also accredits training programs and admits individuals to different classes of membership. Recently, its modus operandi has been studied, and the processes have been streamlined. Among other things, ASHA did not approve of a professional doctorate comparable to the EdD being equal to the PhD, but does admit clinicians with less than the doctorate (ASHA, 1983). How has this worked? Has the ASHA charge been too broad?

In the American Statistical Association, a committee of a few senior people with outstanding reputations sets and controls standards. One board member, who shall remain nameless, told me recently: We trade off judgment by a select few to maintain standards, versus peer control, which is too often a process of "You scratch my back and I'll scratch yours." Here is a feature that makes sense to me.

Another group with which we have a fairly close association is pediatricians. Because its system is so well established, I chose the American Academy of Pediatricians as the prime example to present here. Even to be eligible to be an associate fellow in the organization requires 4 years after medical school and the MD degree—a regular 1-year residency, plus 3 years in a pediatric residency. You may join, as an *associate*, if you pass an oral examination in your last year of pediatric residency. Then, after practicing for 1 to 2 years, if you pass

written examinations, you advance to the rank of *fellow*. So both written and oral examinations are required. Pediatricians can be certified in subspecialties, and I'll come back to this feature. There is a higher rank reserved for *diplomates*—those selected by the membership as outstanding. It is the diplomates who set the standards for admission and retention, and for ethics and conduct. As I mentioned earlier, this is a feature of which I approve.

A SPECIAL EDUCATION START-UP MODEL

While the membership procedures of the American Academy of Pediatricians appeal to me as a model to build upon, as I've already mentioned, I feel we should not firm up the organization for an American Academy of Scholars in Special Education without first looking in detail at a number of other professional groups. All I have done so far is to open the door. So anything I suggest here is very tentative—notions to be examined and improved upon. With this in mind, let me make only four points about a special education start-up model. Many more come to mind, but now I am only laying a broad brush to this proposal:

First, I lean somewhat toward restricting the academy to educators of the handicapped. For 60 years, we have attempted to combine the gifted and handicapped under the rubric "exceptional children." It has not worked well and, in my view, it won't. So, I would recommend that you consider not including the area of the gifted, although I realize many colleagues will disagree. So this is another issue to resolve. Too, what is to be done about the areas covered by ASHA? Do we duplicate, do we avoid, or do we join forces? This needs to be worked out.

Second, the idea of three grades of membership appeals to me—some nonsexist version of associate, fellow, and diplomate, such as *scholar*, *distinguished scholar*, and *diplomate*. To apply for the lowest rank, I suggest, would first require a minimum of an earned doctorate in special education, or some behavioral science such as psychology, or a postdoctorate in special education, plus perhaps one or two years of successful college teaching in our field, or other appropriate experience. It would be necessary to pass at least written examinations, perhaps an oral examination as well if this is feasible. The standards for the two advanced ranks would be even higher.

Third, the issue of subspecialties needs to be resolved. One dimension to be considered is teacher training versus research. But I recommend that a member of the academy should be required to demonstrate *both* excellence in teaching and excellence in research—not simply excellence in one or the other. Another type of subspecialty

would be by areas of disability. At this stage, I favor an initial broad examination across the disabilities. For example, I understand the APA clinical psychology division uses a 200-item test covering 15 areas for its broad, general examination. In addition, clinical skills must be demonstrated. Perhaps initial membership in the academy should require only demonstrated proficiency through passing a broad, general examination. Academic certification in specific areas of disability could come later.

Fourth, as implied in the previous point, I believe the first major function of the academy should be prescribing and applying standards for membership in the organization. This raises the question of whether to grandfather in established scholars in special education. One could argue that everyone should be treated equally. However, to start, I'd recommend that honorary diplomates be awarded. I would project that the academy would have a potential membership of under 2,000 after 5 to 10 years. So an original list of perhaps up to 50 honorary diplomates makes sense. Perhaps most of these should be retired, or near-retired special educators with long and distinguished careers as university professors, including fine research and publication records. Past presidents of CEC with earned doctorates and others should also be considered. We need to be sure these people are above and beyond having an axe to grind. From this pool of distinguished scholars would be established committees to set initial standards. During this start-up phase, other issues, such as refresher requirements and retention, will need to be addressed by this pool of honorary diplomates. This strategy would avoid peer review. Honorary diplomates, however, should be phased out of standard keeping as full diplomates are awarded and become available to take over responsibilities for admission and retention in the academy.

Initially, this cadre of honorary diplomates would also have responsibility for accrediting doctoral programs in special education. Perhaps as many as half of the 59 NCATE-accredited institutions now offering the doctorate in the field would need to upgrade, or else not be accredited by the academy.

SOME THOUGHTS ON MODUS OPERANDI

To conclude this proposal, allow me to touch on five notions about modus operandi:

First, I do not believe my premise should be accepted at face value that the doctorate in special education is in trouble. Instead, I would suggest that probably the first step in examining the feasibility of my proposal is to conduct a national status-quo and evaluative study into the doctorate and related subjects, which it is hoped would lead to

some major recommendations on raising standards. But a word of caution. There is growing disaffection with studies in our society; they are primarily a delaying tactic. So this phase should be brief, perhaps lasting no more than a year.

A good foundation has already been made for such a study by a committee of the Deans' Network established in 1981 to study broadly the status of doctoral programs in schools of education throughout the nation (Schneider, Brown, Denny, Mathis, & Schmidt, 1984). This study was begun because "no standards currently exist for assessing the quality of doctoral programs in education, and no organization or association is charged with responsibility for conducting such assessments" (p. 617). Here is evidence that the deans themselves do not believe NCATE has been doing the job at the doctoral level. By the way, this project is housed at the University of Illinois. But be forewarned. Such a status study is not likely to be too revealing unless it is possible to evaluate graduates of programs as to their competence.[3] Heads of doctoral programs, doctoral students, and even alumni of these programs are not likely to discredit their own, since this would reflect on their status. So there are arguments for not making such a study, and simply getting on with the business of establishing the academy on the basis of a generalized felt need. But if the study is conducted, already a number of papers have grown out of this Deans' Network comprehensive investigation. Therefore, a substantive point of departure is being established for a focused look at the doctorate in special education.

As part of the initial investigation, a careful study needs to be made of how a number of existing professions are organized to set and maintain standards for accreditation and membership, and how well their systems are working. As said before, we need to look especially closely at APA and ASHA. We can learn much from the experiences and suggestions of others. Let's avoid the problems they've encountered.

Second, should there be a "go" for an academy, prospective members of it need to know what competencies they would need to attain membership. This brings me to a recent movement in teacher education, namely the competency-based curriculum. I realize this idea is pretty well dead today because of faculty resistance and because it revealed how small is the knowledge base that is unique to special education. But it is a good idea that will cycle back time and again. I see it as the way to go in outlining the knowledge and skills needed by college faculty in special education. Developing this competency-

[3]Some hint of quality, or lack of it, would come from a careful study of doctoral dissertations and other research reports of graduates of programs.

based curriculum would be a second step in implementing my proposal.

Third, to elaborate on the second point, how are people going to prepare themselves for the examinations of the academy? At least three routes come to mind:

1. As one obvious strategy, some will be so well prepared in graduate school and beyond that they can pass the examinations with flying colors.
2. As a second strategy, others might feel that a little boning up would be in order, so let's provide for the self-taught person. For example, the man we are honoring at this colloquium never had a course in mental retardation or learning disabilities, never had student teaching in either area, and never obtained a teaching certificate, yet he "made it." So I propose the competency-based curriculum should include the key library references for independent acquisition of the needed knowledge. (I can see whole special education faculties forming a study team to gain admission to the academy.)
3. A third strategy for gaining needed competencies could be a postdoctorate, in a block or in units. Perhaps two or three regional centers would be needed for this purpose. I see more disadvantages than advantages of having them at universities that now offer the doctorate in special education. So such prestigious institutions as Stanford, the University of Chicago, and Yale or Harvard come to mind as centers. In a recent issue of *Psychology Today* Fred Keller (1984) describes his Personalized System of Instruction (PSI), which seems to me to be ideal for acquiring mastery of needed competencies to become a master college instructor. But, as he says, "reforming college teaching is like taking a wounded moose from a pack of starving wolves." I believe that one Sam Kirk at Stanford, another at the University of Chicago, and still another at Yale or Harvard, as visiting faculty, plus an array of guest lecturers, the best available, would do a better job, with the PSI system, than any other strategy that comes to mind.

Fourth, as for a source of funds for this undertaking, I would be wary of using, but not reject, federal funds, because a hard look needs to be taken at the role of the federal government concerning standards. My guess is that the government would welcome an academy such as proposed here and would be prepared to help fund its standard-setting functions, since there must be a better system than now exists for the distribution of the taxpayers' money. Nevertheless, I'd recommend we first turn to such private sources as the Carnegie Foundation. This foundation could provide a headquarters for the

study, is interested in the topic, has funds, and has already published reports similar to the ones that would grow out of this investigation. As a steering committee I'd have a group made up largely of persons who would qualify as honorary diplomates, but an additional member should be the current CEC representative on the NCATE Council. Other knowledgeable persons might be added, perhaps as consultants.[4] As for staff, an executive director would be needed. To provide a fresh look, perhaps some capable, productive, critical scholar who has just obtained a doctorate in special education, and who has not yet become a faculty member, should be selected. Another possibility would be to persuade an established scholar, who knows where the skeletons are buried, to take a sabbatical to coordinate this study.

Fifth, what role should NCATE and CEC play in this project? In my view, the major reason an academy is necessary is that neither of these organizations has chosen to act vigorously to set and maintain standards at the doctoral level. So the academy needs to be independent of these and similar entities. Yet, from the inception, their cooperation and consultation would be of considerable value. By the way, I believe that, in the long haul, an independent academy would strengthen, not weaken, CEC because teacher education in the field would be improved significantly.

There are many, many other aspects of this proposal that need to be thought through, such as how to assemble a critical mass of faculty ladder-climbers for postgraduate study, how to build in strong inducements to attain membership in the academy, and so on. My aim here has been to test out a proposal on you that is only beginning to evolve, and to give you a frame in which to build.

CONCLUDING OBSERVATIONS

By way of concluding comments, please permit me two final observations.

First, just because a person holds a doctorate in special education gives little assurance to a college president, dean, or chairman of a department that he or she is adding to the faculty a knowledgeable scholar, and a productive worker. Let's face it; the EdD and even the PhD in education doesn't mean much any more, and administrators can seldom phone a major professor, or an associate of a prospective faculty member, and get an honest, frank evaluation. In 10 years or so, I would hope no university administrator would permit anyone

[4]Other examples include representatives of such regional organizations as the Southern Regional Education Board and the Western Interstate Commission on Higher Education. Regional accreditation associations in higher education should also be considered, such as the North Central Association of Colleges and Schools.

to serve, at least on the doctoral faculty, and better still, in the graduate school, who is not a full member of the academy. But I would also hope, eventually, that the academy would raise standards across all levels of college instruction in our field, if not in all of teacher education.[5] My plan only gets the ball rolling.

As a *second* observation, we senior people who are retiring must apologize for not having added enough oil to, or trimmed the wick well enough of our particular lamp of learning. As we watch your generation carry on, it would be nice to see the status of special education, yes of all education, increase to where every one of us can be as proud of our chosen field as I am of being associated with my major professor, Dr. Kirk. To paraphrase a song written long before your time: "It would be nice to swing on a star. We can be better than we are." Come on! Let's agree. While the winds of social change have increased from a breeze to a hurricane, as yet they have not begun to blow the cobwebs out of colleges of education in general, and special education departments in particular. Let's set standards for the other specialties in education to emulate. I feel confident that most senior citizens in the field stand ready to assist in the process. The academy that has been proposed herein seems a feasible device to get on with the job.

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[5]Some people who have read this proposal have suggested the academy be broadened to serve the total doctorate in education. This is an idea that needs evaluation. Perhaps an academy restricted to the doctorate in special education is too narrow a focus and will not reach the critical mass of members needed to finance it.

Another option would be for special education to join in a growing movement to establish a new profession, including clinical, school, and community psychology among other behavioral scientists who serve the handicapped (Levy, 1984).

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CHAPTER 11

The Future of Legislative Advocacy for Exceptional Children

Elizabeth M. Boggs

PRESCRIPT

Although she may not be fully aware of it, the position occupied today by the Assistant Secretary for Special Education and Rehabilitation Services, Madeleine Will, and the legislative climate in which she works owes much to Sam Kirk. His professional contribution to the field and to paving the way for the Bureau of Education for the Handicapped are described elsewhere in this book, but it is appropriate that I be the one to speak about his relationship to parents and to the parent movement. Here, too, Kirk set the stage for P.L. 94–142 and for Mrs. Will, the parent/educator. Sam Kirk pioneered as a professional who showed respect for parents, both as individuals, and as a group plowing new ground in a professional and political world, a world that thought the parent of a retarded child was likely to be less than competent himself (or herself).

It started with the book *You and Your Retarded Child* (Kirk, Karnes, & Kirk, 1955), a classic, that at the time was the only full-length book directed to parents whose children were living at home. It addressed them with practical candor and in a straightforward style. Dr. Kirk also played an important role in the early days of what is now the Association for Retarded Citizens. He was selected in 1952 as a charter member of the NARC Scientific Research Advisory Board, standing

alone there in the field of research in special education. At our 1953 convention in Chicago, he gave a plenary session address describing the comprehensive program already under way at the Institute for Research on Exceptional Children (Kirk, 1953). In 1953 also, while NARC was still a struggling organization without any professional staff, Kirk foresaw and proclaimed its impact. (Kirk & Kolstoe, 1953).

In 1955 legislation was introduced in the U.S. Congress to make federal funds available for the first time for training personnel in special education, for leadership as well as for classroom teaching. It was finally enacted in 1958 and became P.L. 85–926, the direct antecedent of present more ample provisions. It was Sam Kirk and his students who made this law credible by modeling the university based training programs in research and service that this law sought to replicate.

Dr. Kirk saw significance in the efforts of parent groups to organize day classes for children who in the post World War II era were almost everywhere excluded from school because they were believed to be "uneducable" by virtue of having IQs below 50. He thought these efforts, and more particularly the children in the classes, deserved to be studied formally by the methods of "operations research." He assigned Morvin Wirtz, then a promising graduate student at IREC, to conduct a nationwide survey of them, thereby giving them greater importance in the eyes of public school administrators (Education Committee of the National Association for Retarded Children, 1954). Thus, he hastened the day when state and local school districts would once again assume responsibility for them—a responsibility that had been sloughed off in many eastern and midwestern states during the depression of the 1930's. It was the resulting state legislation of the late 1950's and the 1960's that made possible the federal legislation of the 1970's.

AN ANALOGY

Sam Kirk created a new climate—which leads me to a topic I want to talk about—the weather. Proverbially the weather is something everybody talks about but no one does anything about. In fact, the weather is something that everyone (especially farmers, fliers, builders, and skiers) can do something *with*. Many of our strategies of daily living are heavily influenced by our anticipations about the weather, on a short-term basis (setting a rain date), on a mid-term basis (putting in more insulation before next winter), or on a longer-term basis (planning to retire to Arizona).

Weather has some interesting characteristics. It moves along irregular paths around the world. Furthermore, weather cycles are some-

what irregular. There are diurnal cycles, for example, temperature fluctuations that usually but not always peak during daylight and reach their lows during the night. There are intermediate cycles, usually lasting several days as successive highs and lows follow each other from west to east. There are seasonal variations in precipitation as well as temperature, bringing recurring monsoons or periods of drought. There are very long-range effects (which we tend to discount), some of them man-made, such as the increasing average temperature anticipated as a result of the increasing concentrations of carbon dioxide in the upper atmosphere. And then there are disasters—intense, usually unpredictable localized instabilities, such as tornadoes, or sudden events that cause broader devastation, such as major floods.

We all know how important the weather forecast was the night before D-day—the day of the Normandy invasion. Access to weather information is a form of power subject to political management, but thus far the weather itself has not been very manageable. Cloud seeding has been used only to a limited extent, for example. Human beings are still doing as they have done since prehistoric times—adapting their life-styles to weather conditions rather than vice versa. However, this may change; it has recently been reported that new technologies are being developed which will make it possible to change the course of the jet stream at will.

It is not too soon to think about the possibilities of politicizing the weather. What will happen when rain can be arranged? Given the opportunity to vote on each day as it comes, the majority of the population would undoubtedly vote for a fair day tomorrow, but with what eventual effect on the food supply? Would we be less swayed by present gratification on this issue than we are on the deficit? Already we are aware of some of the political, social, and economic effects (interstate and international) of political intervention in the containment and diversion of the waters of the Colorado River. Floods are a direct consequence of weather, and flood control issues are already political issues.

Why am I spending so much time on the weather? Because I see such a neat and useful analogy between the relationship of the worldwide weather system to our daily lives and the relationship of the macroeconomics and macropolitics of our social system to the microeconomics and politics of disability. There is little we advocates for special education can do to modify the highs and lows of the global economy, but, if we are foresighted, we can take advantage of them. Some observers think P.L. 94–142 gained support by its timing; it not only created jobs for teachers in a period when the demand for "regular" teachers was declining, but it also provided federal aid to

school systems under pressure from federal courts to provide more equitably for students with disabilities. So bear with me.

Meteorologists are prototypical futurists. Weather forecasting has become an increasingly sophisticated science whose results are synopsized for us on every network and local newscast. Listening to several different forecasters who are dealing at a given moment with essentially the same current weather facts—the atmospheric pressure, wind direction, and so on—one usually finds a general consensus, with minor differences of emphasis, about what is most likely to happen in the next few days. But in periods of great atmospheric instability it becomes anyone's guess. Will the blizzard bypass New York? Will the hurricane hit South Carolina? Will the snowfall exceed 10 inches? Will the dam break? Above all, how far in advance will the best forecaster be able to give warning? And how will he or she do it?

The science of weather is called meteorology. How many meteors have you heard them report on lately? Perhaps this term is used to emphasize the importance of the occasional unforeseen or anomalous event.

Most significant catastrophic events arise out of the convergence of several different, perhaps unrelated, conditions, some individually more predictable than others. For example, coastal flooding is most likely when high onshore winds coincide with highest tides. Much of the forecaster's day-to-day usefulness depends on his or her routine application of technical skill in documenting trends and keeping the computers fed with updated information, but his or her creativity comes in the perception of small signals indicative of large events in the future. That cloud on the horizon "no bigger than a man's hand," is it significant, or, more accurately, under what additional circumstances may it become significant? Will those circumstances converge, and, above all, *when*?

It is these possibilities that give spice to the life of meteorologists.

Let me give an example from another field. Some years ago, I attended an advisory group meeting at Texas Tech in connection with a project to apply "technology assessment" techniques to the field of rehabilitation of the handicapped. A Japanese engineer from Michigan recited an incident that well illustrated why it is important to combine insight with data analysis when anticipating the future.

After World War II, it was quite apparent to anyone who thought about it that civilian air transportation was going to undergo a rapid expansion. Consequently, many municipal governments saw the importance of enlarging their airports to accommodate a larger volume of traffic and larger planes. This was a sound conclusion based on available data; however, none of them had the insight to foresee the

advent of the jet plane, with the result that many major airports were enlarged, only to become obsolete before the bonds could be retired.

THE ROLES OF FUTURISTS

Today major industries and governments employ professional futurists in the hope of avoiding such gaffes. I am not a professional futurist, but I believe that their approaches (which involve combining hard trend data with soft flashes of imagination or insight) are applicable to a discussion of the future of legal and legislative advocacy for persons with disabilities.

Futurists began telling us some time ago that we were moving to a postindustrial society in which service workers would outnumber production workers and that high tech would be its driving force. The new age has now arrived and it has a name—the *information age*, whose mainstay is the *knowledge worker*. The pace has quickened and the futurists are busier than ever.

There are, of course, different kinds of futurists. Alvin Toffler (1972) describes those who are primarily interested in exploring the future (or alternative futures) and those who are primarily interested in changing the future. Meteorologists fall in the first category. People in special education, if they are future-oriented, usually fall in the second category. These would-be change agents usually believe in the power of the self-fulfilling prophecy so they are likely to devise optimistic scenarios.

During 1982, several conferences were convened on the future of special education. I have read materials emanating from these gatherings and they are indeed optimistic or at least hopeful. (Lilly, 1982; Sontag, 1983; Trohanis, 1983). I am glad that this is so, but optimism must be tempered with realism. Futurists have to be *plausible*—"way out" is fine, but only if you can show a plausible path or paths from here to there. This concept is not alien to anyone who understands an IEP (individualized education program). The trajectory starts at a known point, today.

Every day an infinity of speculative futures becomes implausible because the intermediate status projected for today has not materialized. We are all getting familiar with the idea of a "window" in space-time. The window depends on the launch date. When the launch is postponed, the window moves, narrows, or vanishes. Because we did not balance the budget last year, we cannot balance it next year. But even as infinities of possibilities die every day, there are nevertheless infinite possibilities left.

The discovery in 1959 that people with Down's, and Klinefelter's, syndromes had trisomies originating at conception eliminated all the

various speculations about postconceptional causes (and hence obviated a lot of maternal guilt) but, as George Jervis pointed out (in conversation) shortly thereafter, for every speculation set aside, a new one became more plausible. And so it is with science generally. Thus, scientific investigation is itself a certain special kind of futurism. Of course, the facts, known or unknown, are not changed by speculation, but the time of their discovery may well be influenced by the images projected by scientists.

All of us who have participated in the research enterprise are aware of the "aha" phenomenon—the moment in which one knows that one has the answer sought, or, better yet, has a heuristic insight into a question one had not asked. Moments of insight are not limited to researchers. They may be personal—the moment you know you are in love. They may be intellectual; I still remember vividly the moment that I understood what calculus is all about. Onlookers can have them, too. I remember a moment in the early 1950's when I first heard Sam Kirk describing to some third party his new insight into the "educability of intelligence." There was an excitement in his tone that told me that this was a turning point. I was experiencing a moment of vicarious insight. Similarly I remember a day in the early 1960's when Lloyd Dunn and I were both on President Kennedy's Panel on Mental Retardation; Lloyd described a letter he had received from a school superintendent in the deep South who wanted Lloyd's help in establishing criteria for classifying students for special classes for the educable mentally retarded. Lloyd was saying that this letter had triggered his insight into the strategy of some southern (and later northern) educators, and that this in turn triggered his examination of the issues subsequently explored in his seminal article examining the utility of special classes (Dunn, 1968; Gallagher, 1972; Heller, Holtzman, & Messick, 1982).

Turning points in legislative history may also be foreshadowed in moments of insight. I remember well the colloquy between Wilbur Cohen, speaking for the administration, and Senator Wayne Morse, who was chairing the Senate committee hearing on the Elementary and Secondary Education Act in 1965. The colloquy established that the administration would interpret the act to include as "disadvantaged" children with handicaps without regard to the socioeconomic circumstances of their parents. Although this provision was not subsequently exploited, partly because, as Martin (1968) has so eloquently described, it was preempted almost immediately by the enactment of categorical special education legislation (Title VI of the Elementary and Secondary Education Act) in 1966 and 1967, I believe the recognition of handicapped children in the landmark generic legislation of 1965 (P.L. 89–10) was a pivotal conceptual event in the history of

Congressional perception of the rights of handicapped children to education in the public schools.

LEGISLATIVE ADVOCACY—THE PROCESSES

In the rest of this book, contributors describe the *substance* of our growing knowledge of exceptional children, which in turn influences the substance of "authorizing" legislation and its interpretation by administering agencies. I wish to discuss the *process* by which legislators, and in some instances judges, are likely to carry out their activities in the future. These processes have changed markedly in the past two decades and will undoubtedly continue to change. They are determined by social forces quite outside the microworld of the handicapped, and it behooves us to seek both solid information and creative insights into these forces as they are currently at work.

In the article I cited previously, Dr. Martin gives a picture of the way things were in the 1960's. In those days, the administration proposed and the Congress disposed. Bills sent over by the executive agencies were treated with respect. A chairman who wanted to introduce a bill on a topic within his jurisdiction could invite the appropriate executive agency to draft it for him.[1] At hearings, the administration witnesses were always heard first and with the deference due to experts. Despite partisan differences at the top, there was a mutual trust among the professionals on the Hill and in the agencies. They shared technical information and ideas freely.

Partly because of this professionalism on both sides, Congress was able to conduct its business with a modest staff. Congressman Fogarty had one secretary and one administrative assistant in his Washington office. The Subcommittee on Appropriations for Health, Education and Welfare, and Labor, which he chaired, had exactly one professional staff member. When he asked for help on technical matters (or even in writing a speech), HEW was glad to oblige.

Much of that changed during the Nixon administration. Watergate created deep distrust and had a profound impact; but even before Watergate, in the early 1970's, the horizontal communication links were breaking down both at the top (political) and intermediate (permanent professional) levels. I doubt that the status quo ante 1969 will be restored in the foreseeable future except on a very partisan basis.

In a talk delivered to a Joint Meeting of the Mental Retardation Research Centers and University Affiliated Facilities in 1976, Jim Gal-

[1] P.L. 85–926 (1958)—the legislation on preparation of personnel in education of retarded children, which helped many people study at IREC in the early 1960's, was such a bill elicited by Congressman John E. Fogarty, a Democrat, from the Eisenhower administration.

lagher described the pre-Nixon era and contrasted it with the developments in the mid-1970's that brought fairly massive Congressional reform in two areas: (a) the committee system, with a relaxation of the fetish of seniority and with a consequent proliferation of subcommittees, and (b) Congressional management of the budget and its derivative appropriations processes. The procedures established to enable Congress to control the budget process as a whole (instead of just its parts) made possible the devastating OBRA (Omnibus Budget Reconciliation Act of 1981). Although billed as a fiscal document, this legislation contained a large number of substantive legislative changes including but not limited to block grants.

Not all the substantive changes were restrictive, however. For example, it is to this bill that we owe the so-called Section 2176 waiver authority, which in 1983 underwrote about $145 million worth of community services for retarded persons who would otherwise be institutionalized.

In the past 15 years, there has been a phenomenal increase in Congressional staff (50% just since 1977), and with it a corresponding increase in the number of both professional and lay lobbyists. Although the vast majority of the career lobbyists represent business or labor interests, health and education have their share of sophisticated professionals representing organizations with some stability, such as The Council for Exceptional Children or the American Psychiatric Association on the one hand, or consumer groups such as the Association for Retarded Citizens, United Cerebral Palsy Associations, and the National Association for Children and Adults with Autism, on the other. The less professional "angels' lobby" of the 1950's (typified by ARC types then, and now by MADD [Mothers Against Drunk Driving]) has proliferated and has become quite fluid. Many small organizations with narrowly targeted objectives ("special interests") have also been spawned. Anyone interested in grass roots parent advocacy in the 1980's should read *Parent to Parent* by Peggy Pizzo (1983). Along side of all these, the organizations representing various strata of state officials have multiplied in number and influence, beginning with the National Governors' Association. Many members of Congress are more likely now to introduce a bill drafted by one or more of these groups than one sent over by the administration.

There is unfortunately a certain parallel to the arms race. The more staffers, the more lobbyists, and hence the need for more staffers to meet with them. In addition to dealing with people seeking to influence the legislative process, members of Congress have increasingly taken on the task of advocating for individual constituents vis-a-vis the bureaucracy. Casework has come to be an accepted function of each senator or representative to which he or she may assign several

staff positions. The quality and quantity of their casework becomes a factor in the record of incumbents running for reelection. One beneficial outcome can be that the legislators get a kind of grass roots feel for defects in legislative design, or, more immediately, for administrative aberrations from Congressional intent. For example, members of both houses heard very directly about the system breakdown that triggered the wholesale disallowances in 1981–1983 for some 400,000 disabled persons who had been receiving social security or SSI benefits. And, of course, legislators still respond to expressions of constituent interest in particular bills, even when they know such mail may be managed by lobbyists. In fact, one reason often given by a Congressman for not acting on an issue is lack of mail on the subject. This is an open invitation to generate "grass roots" letter writing. Some organizations can turn on the mail in 48 hours.

So much for the present. What of the future for legislative advocacy? First, certain trends must be taken into account. We are now into the age of technology and information management. The printed word is becoming less influential because it is too slow, not only to transmit but to comprehend. I learned more from watching a 90-minute TV documentary that used the latest visual technology than I learned from reading the book it was based on—Alvin Toffler's *The Third Wave* (1980). Of course, it was nice to have the book to use as a reference later, but when I get a VCR even that won't be necessary.

President Reagan is now briefed by video rather than memo, using computer-generated graphics similar to those we see on the evening news, only faster, more concise, and without commercials (Smith, 1984). Many legislators are now voting electronically and they (and the public) can have instant information on the status of any bill. Bills are composed on word processors and a computer program can be run to put any mix of figures into any budget "model."

The tempo of everything is accelerating dramatically. In an effort to keep up, the lobbyists are putting in their own computer networks—SpecialNet,™ ARC-Net, etc. Paradoxically, the computer also generates mail that has to be sorted and then analyzed on another computer.

Of course, all this is sometimes frustrating to individual human beings. Have you written your senator lately? What you get back is a synthesized, word-processed reply that answers the questions most often asked on the subject you wrote about but not the question that you yourself asked. The staff is likely to count your letter but not to read it.

Both parties are now committed to controlling federal outlays and that means no net new spending. Defending our hard-won gains may prove harder in the 1980's than winning them in the 1970's. The cycle

of our advocacy may have to swing back, at least for a time, to the 1950's when our legislative efforts were devoted primarily to the state legislatures and administrators. Some observers think the state courts will increasingly preempt the Supreme Court as arbiters of civil liberties, using state constitutional principles immune from federal review (Barbash, 1984). This is in accord with Toffler's (1980) and Naisbitt's (1982) predictions of "demassification" and decentralization.

For the past 4 years, the advocates of P.L. 94–142 have had to circle the wagons against a persistent storm; clouds still hang low and it seems unlikely that the climate for further rapid progress will recur for some time yet. It may well be that—at least at the federal level—special education has reached its zenith in this cycle of history. If the public is now beginning to view handicapped children's rights as being achieved at the expense of rights of other children, we may be moving into a period of backlash. Already, court decisions are showing some ambivalence, suggesting that judges at several levels are beginning to perceive that proper balance between individual claims and society's interests is close to being achieved where public responsibility for education of children with handicaps is concerned. Moreover, special education does not and cannot meet all needs of all children with disabilities. If this is not understood, we may "come a cropper" of parental expectations.

SPECIAL EDUCATION IN THE LARGER SERVICE SYSTEM

Some special educators say that the most pressing current problem for special education is its relation to general education. In my opinion, that is a short-run view. The most serious sociopolitical mistake that special educators may be making right now is in their relationships with the other health and human services. Consider just one symptomatic example: After repeated efforts to negotiate with state special education leaders to establish a proper role for physicians in the lives of handicapped children, and more particularly to obtain a commitment that competent neurodevelopmental examinations will be provided for severely or multiply handicapped youngsters moving into special education, the New Jersey Chapter of the American Academy of Pediatrics has announced it is going to seek legislation to force the issue. All those BEH-sponsored studies aimed at bringing special educators and pediatricians together have had a very modest impact and will not succeed until each views the other's role more respectfully.

Alan Abeson left the headquarters staff of The Council for Exceptional Children a year ago to become executive director of the Association for Retarded Citizens of the United States. I asked him

recently what he now sees as the major issues in special education. Let me quote from his reply:

> [Special educators must] understand that their lives in special education by definition isolate them from knowledge about the full breadth of need and services required to meet the needs of children who are exceptional. Their charge must be to resist their isolation by maintaining involvement in activities that deliver or lead to the delivery of other than educational services.
>
> Further, special educators need to understand that as they move forward in trying to improve the educational services provided to children, they are confronting many of the same dilemmas being encountered by other professional disciplines. A good example is in the whole arena of quality assurance. All disciplines are increasingly recognizing the need for the development of standards. Related to quality assurance, as well, is the development of ethics which by and large should extend across disciplines—particularly since the programmatic efforts that are provided come from essentially the same theoretical and research bases. (A. Abeson, personal communication, July 13, 1984)

I might add that the term *interdisciplinary* does not mean getting education together with vocational rehabilitation. The current emphases on "transitions" for the aging-out population have been forced by demographics, and their shape has been limited in part by the jurisdiction of the Office of Special Education and Rehabilitation Services. What about issues of housing, health care, independent living, income maintenance, and social adaptations? If we can have "supported work," we can have "supported marriages," but not many people are talking about them even in an era when "family values" are extolled.

There is a future for legislation and advocacy for special education; it lies in the larger arena of advocacy for children with disabilities and with the adults whom they become, as well as with members of the Academy of Pediatrics, the National Association of Social Workers, the American Public Welfare Association, and the American Bar Association, not to mention an array of other health professionals, architects, and public administrators. Trying to look at special education apart from contemporary issues such as genetic engineering, ethics, aging, working women, long-term care, and the gamut of the neurosciences is like trying to study storms without studying oceans.

TRENDS AND INSIGHTS

I have tried to practice what I preached at the outset and to identify observable trends in the various cycles of events that will create the climate in which we will advocate in the next decades. As with the weather, adaptation based on foresight is the strategy. But do I have

any flash of insight for you about some singular event, some meteor coming over the horizon? Yes. Consider this prospective constellation of events:

1. There are currently at least four serious proposals afloat for amending the Constitution—ERA, abortion, school prayer, and the balanced budget. Each of these has a different cross-partisan constituency. All constituencies are currently sensing frustration.
2. The accrued decisions of the Supreme Court, traditionally seen as being built on one another according to sound and accepted principles intrinsic to Constitutional democracy, are coming increasingly under scrutiny. This branch of government, heretofore viewed as the most stable and consistent, is more and more being viewed as subject to political management like the other two.
3. Serious scholars are increasingly questioning whether presidents today have, under our Constitution, the kind of power needed to govern in the new information age. "Maybe no president could govern under this Constitution" was a page-wide headline in the *Washington Post National Weekly Edition* on May 21, 1984. It brought attention to a review by Hodgson (1984) of a new book by James MacGregor Burns (1984). Its title: *The Power to Lead—The Crisis of the American Presidency*. Praising the framers of the Constitution for what they did in their own time, Burns says that they "bequeathed us a structure of power that today not only fragments creative and collective leadership but frustrates any major efforts of leaders to rid it of its anti-leadership qualities. We cannot make political (mainly party) changes unless we make structural (mainly constitutional) changes first, but we cannot do the reverse either. . . . This is catch '87" (p. 240). Burns is not alone in asking soberly for Constitutional reform of our political institutions. In the same issue of the *Post*, a book by John Lukacs was reviewed by Yoder (1984) under the heading "American Democracy in the Past Tense." Alvin Toffler ended his book *The Third Wave* (1980) with a chapter on "The Political Mausoleum."
4. By this time next year, perhaps even before these proceedings are published, we will be hearing increasingly frequent reminders that 1987 is the 200th anniversary of the drafting of our original Constitution. Between now and then, we will be offered commentaries, analyses, historical reenactments, and critiques of this document—some very insightful—through every medium of the information age. This focus on the fundamental structure of our federal government will continue for another 4

years beyond 1987 in anticipation of the celebration in 1991 of the bicentennial of the adoption of the Bill of Rights.

5. Polls show that the majority of Americans revere the Constitution, although a minority view it as outmoded. That balance could change as attention is focused on its shortcomings. Although it is unlikely that a consensus will emerge on what specifically ought to be done differently, the demand for many discrete changes could escalate during the next 7 years and lead to a pluralistic assault on the Constitution itself.
6. Already there are calls for an unprecedented Constitutional convention. Article V of the Constitution provides two means for its amendment. The first calls for initiation by Congress; the second authorizes a convention, called for the purpose, based on an "application" to Congress by two thirds (34) of the states. In either case, the resulting text must be ratified by three quarters (38) of the states. The second method has never been invoked since the adoption of the original Constitution in 1787. Now, however, there is an active lobby, led by the National Taxpayers Union, to call a Constitutional convention on the balanced budget amendment favored by President Reagan. Of the 34 states that must be heard from in order to force Congressional action, 32 have already formalized their applications and the campaign appears to be gaining momentum.
7. In anticipation of this possibility, the Senate Judiciary Committee has reported out a bill designed to restrict any Constitutional convention so that it could act only on the specific issue raised by the states in their call. However, many scholars think the bill is loosely drawn and, in any case, doubt that such a limitation would itself withstand the test of constitutionality (Mathews, 1984). This leads to the prospect of open season on the Constitution of the United States.

Think of it! Due process, equal protection, least restriction, *Brown v. Board of Education*, PARC, Mills,—these are the underpinnings of P.L. 94–142. They are all constitutional issues. Stronger forces than we alone can muster will undoubtedly come together to defend the Fourteenth Amendment, and they may well prevail in the end. Yet even if the tempest passes, what will it mean to us to be housebound for a decade of uncertain weather during which few litigative or legislative forays with constitutional overtones are likely to be successful?

Perhaps we should remember that, although predictions of good weather are not self-fulfilling, predictions of bad weather, even though unwelcome, may, when heeded, lead to strategies for survival with the least damage. Each season has it own tasks.

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CHAPTER 12

Public Policy and Special Education: An Unfinished Agenda

Edwin W. Martin

Some years ago during conversations with special educators in the Soviet Union, they commented that they felt public attitudes and programs for the handicapped in the United States received much positive impetus because of the involvement of President Kennedy and his family with mental retardation. It was an interesting example not only of how public policy often develops, but also of how concepts and ideas transcend national boundaries.

More recently, there have been conferences in England, Scotland, and France, among other sites, where public policy in those nations was being influenced by our Public Law 94–142 and its guarantees concerning the education of handicapped children. As one who was involved in the development of that legislation, it has been somewhat awe-inspiring to hear its concepts discussed in UNESCO meetings, international conferences, and among legislators and government officials from other lands. I felt not only a sense of pride in our national values and actions, but a sense of responsibility as a professional for continuing to observe the impact of our programs and for assessing their strengths and weaknesses, with the understanding that lives of children around the world will be influenced by our experiences.

When President Kennedy, as part of his administration's efforts on behalf of the disabled, decided to establish an administrative unit in the United States Office of Education, he turned to Samuel Kirk

for that program leadership (Martin, 1968). It was an historic step in the evolution of public policy toward the disabled. The president proposed new programs of assistance for the mentally retarded and other persons with disabilities and also established a governmental unit to manage those programs. These actions gave new significance to the subject of education for the disabled—the government was willing to use its power and influence to help advocate a better life for them, and it is fair to say that, in picking Sam Kirk, the president of the United States was sending a special message. He was attempting to provide leadership from a person who was, with little argument, the leading figure in special education in this nation. From a position of minor importance and influence within the United States Office of Education and perhaps in the educational system at large, special education was suddenly on the map.

Unfortunately that map, like the one of 19th and 20th century Europe, was subject to regular revision. By 1965 the Division of Handicapped Children and Youth was abolished and special education was scattered across the labyrinthian bureaucracy in the Office of Education (Martin, 1968).

In 1965, at President Johnson's request, the Congress passed legislation approving more than $1 billion (at that time a mind-boggling sum) for improving education for the disadvantaged and, in addition, passed related legislation strengthening other aspects of elementary and secondary education (P.L. 89–10, 1965). Despite the broad scope of this legislation in its concern for the poor and educationally disadvantaged, it had no provisions designed specifically to benefit the disabled. It is a comment on the low visibility of education for the handicapped that a socially conscious president and the Congress could pass sweeping legislation directed at educationally needy children and never have the handicapped in mind.

However, one year later in 1966 the Congress passed an amendment to the Elementary and Secondary Act, a new Title VI, which would also be known as the Education of the Handicapped Act (see Table 1). It established a Bureau of Education for the Handicapped, a National Advisory Committee, and a small program of grants to the states for initiating, expanding, or improving special education programs. The grant program was funded with only $2.5 million its first year, but the establishment of the bureau was a significant breakthrough. The bureau was a major administrative unit, larger than the abolished division, and equal in status to the units administering higher, vocational and elementary and secondary programs (Gallagher, 1968). I might add that once again the government turned to a member of the group from the Institute for Research on Exceptional Children; this time they turned to Jim Gallagher, to head a new unit for the disabled.

TABLE 1

Selected Federal Legislation Affecting Education of the Handicapped, 1957–1975

Year	*Authority*	*Purpose*
1957	P.L. 83–531 Cooperative Research	Action of the Appropriations Committee earmarked for the retarded approximately ⅗ of the $1 million appropriated.
1958	P.L. 85–926 Professional Personnel	Grants for training leadership in education of the mentally retarded.
1963	P.L. 88–164, Section 301 Professional Personnel	Expanded authority to train personnel for handicapping conditions not previously covered; "hard of hearing, speech impaired, visually handicapped, seriously emotionally disturbed, crippled, or other health impaired" were added to mentally retarded and deaf.
	P.L. 88–164, Section 302 Research and Demonstration	Grants for research and demonstration projects in the area of education of the handicapped.
1965	P.L. 89–10 Elementary & Secondary Education Act (ESEA)	Grants to states to assist low-income children (nondisabled).
1965	P.L. 89–313 State Schools	Amended Title 1, ESEA, to provide grants to states for children in state operated or supported schools for the handicapped.
1966	P.L. 89–750 Education of Handicapped Children (Title VI, ESEA)	Grants to states for preschool, elementary, and secondary school children; National Advisory Committee; Bureau of Education for the Handicapped.
1967	P.L. 90–247 Amendments to Title VI, ESEA	Regional Resource Centers; Centers for Deaf Blind Children; expansion of Media Services; grants for Recruitment and Information dissemination; earmarked 15% of Title III of ESEA for handicapped children; intramural research and contracts for research; increased funds for state schools; changes in Title VI grants-to-states formula and authorizations.
1968	P.L. 90–538 Handicapped Children's Early Education Assistance Act	Created a program of grants in support of model approaches to preschool education for disabled children. Led to national and

(Continued)

TABLE 1 (Continued)

Selected Federal Legislation Affecting Education of the Handicapped, 1957–1975

Year	*Authority*	*Purpose*
		international expansion of such programs.
1970	P.L. 91–230 Education of the Handicapped Act (EHA)	Consolidated the earlier legislation, including Title VI, ESEA, into a freestanding Education of the Handicapped Act and authorized grants for demonstration projects, research and personnel training for education of children with specific learning disabilities.
1973	P.L. 93–112 Rehabilitation Act Amendments of 1973	Section 504 prohibited discrimination against otherwise qualified disabled persons by recipients of federal grants and contracts. Major impact on colleges and public schools.
1974	P.L. 93–380 Amendments to the Education of the Handicapped Act	Required states to begin "childfind" activities, and set goals for education of all handicapped children; led to increased funding for states.
1975	P.L. 94–142 Education for All Handicapped Children's Act (Amendments to the Education of the Handicapped Act)	Provided increased funding for local school districts and states in exchange for guarantees to educate all handicapped school children by 1978, provide due process for parents, and individual education programs, etc.

When one looks back at the federal government's programs in education of the handicapped from the small but seminal beginnings in 1958 of the scholarship programs to encourage leadership training in the area of mental retardation, through the Kennedy and Johnson years, which saw the establishment of such significant programs as the Handicapped Children's Early Education Assistance Act and the legislation recognizing Specific Learning Disabilities for the first time as an educational disability, it is clear that there was a gradual but significant development of a national public policy.

Sam Kirk played a role in much of this development. His testimony in 1966 before the Carey Subcommittee in the House of Representatives played a key role in establishing the need for a bureau (U.S. House of Representatives, 1966). As staff director of that subcommittee, I know how much the leadership of the Department of Health, Education and Welfare resisted that idea, but history has demon-

strated its value. When the Advisory Committee was named, Sam was its first Chairman. While on the committee, he helped develop the definition of learning disabilities which the committee proposed and which was adopted by the Congress, thus clearing the way for the learning disability legislation (Kirk, 1968; P.L. 91–230, 1970). His testimony on the Handicapped Children's Early Education Assistance Act in 1968 was also of great importance (P.L. 90–538, 1968).

In sum, through 1970 we witnessed the development by the Congress, frequently based on recommendations from the bureau, of a variety of beneficial programs following a policy that we in the bureau began to call the "catalytic" role of the government. Our efforts were designed to stimulate state and local programming, to encourage parents, and to provide resources for educators and other professionals for developing more effective methods of teaching the disabled.

"EDUCATION FOR ALL HANDICAPPED CHILDREN BY 1980's"

The 1970's were marked by the evolution of a new federal role; in effect, a new public policy (Martin, 1971). I have called it a transition from charity to rights.

The key message all of us in special education received from parents was a message of frustration and despair when their children were turned away from public schools or placed in inappropriate or substandard programs. Their frustrations with local and state programs led them to petition the federal government as well as the courts for help.

In 1969, in planning sessions with the new administration, we suggested that government policy be based on a commitment to helping each child rather than the more limited catalytic role, but philosophic differences and the cost implications of such a policy led to its rejection. However, in 1971 in conversations with a new U.S. Education commissioner, Sidney Marland, I enlisted him in a plan to use his office to establish a national goal of education for all handicapped children by 1980. Again, the administration's budget officials would not accept a direct federal responsibility for support of state and local programs, but we decided to "call for a national goal," a semantic nuance that allowed us to continue without saying it was an administration goal.

We worked cooperatively with The Council for Exceptional Children, the Education Commission of the States, and other groups to modify as many state laws as possible and we also began efforts to work with the Congress on the legislation which became P.L. 94–142 (1975) (Levine & Wexler, 1981; Martin, 1971). When the federal courts began enforcing parent claims for public education, the state and federal legislation was given a new impetus.

In sum, the public policy of the United States became, for all practical purposes, committed to education for every child, no matter how disabled, and the world began to watch and listen.

From 1963 through 1980, under Presidents Kennedy, Johnson, Nixon, Ford, and Carter, the basic posture of the United States was to support additional federal efforts to educate the handicapped. There were differences in strategy, and various administrations accepted differing federal roles. For example, under the Nixon and Ford administrations, additional funds were requested for such programs as training personnel and model and demonstration programs in the early childhood area. The federal "catalytic" strategy role was accepted. Those administrations did not, however, accept the idea of an expanded role in federal support for basic special education programs at the state and local level, so the growth of funding for state plan programs was very limited. In fact, President Nixon twice proposed cuts of 50% in state plan funds. The Congress did not agree.

In the years between 1968 and 1974, funding for the state plan program grew slowly from $14.25 million to about $50 million. With an estimated 5 million handicapped children, that was only $10 per child. In contrast, the Title I program to aid educationally disadvantaged children was at the $1.5 billion level and supplied over $200 per child.

In 1975, when the Congress was ready to pass P.L. 94–142, the Ford Administration testified against the bill, saying essentially, that it was too costly and should be left to the states (Bell, 1975). There was considerable concern that the bill would be vetoed by the president, and a veto message was prepared by HEW, but the congressional support was so strong that the White House decided to sign the legislation. Interestingly, the president's statement at the signing was the veto message warning of "overpromising," but ending with a new statement saying essentially, "I am reluctantly signing the Act."

During the Carter Administration, a federal role in assisting local programs through a state plan program under P.L. 94–142 was finally accepted. Increases were planned for the grants-to-states program in each budget year, although budgetary considerations held the federal share to about 12% of the average amount expended by the states for educating a handicapped child. Under the P.L. 94–142 formula, the federal share is permitted to rise to the 40% level. Since 1980, the federal share has receded from the 12% level to about 7% or 8% as local and state costs have risen.

In addition to increases in federal appropriations, in the 1976–1980 period the Department of Education (and its predecessor, the Department of Health, Education and Welfare) pursued an active policy of compliance monitoring and enforcement. While it fell far short of

guaranteeing absolute compliance with the Education for All Handicapped Children Act, it clearly demonstrated an active federal role in bringing about compliance, even including support for major confrontations with state officials that involved the threat of withholding federal funds for compliance failures.

EVENTS SINCE 1981

Federal policy affecting the disabled took a radical turn in 1981 when the Reagan administration proposed legislation that would end the federal role as enacted by P.L. 94–142. The proposed legislation would have combined resources previously dedicated to the education of the disabled with funds for other purposes and would have allowed the states to use the resources for nondisabled children if they chose.

In addition to these legislative proposals, concurrent budget proposals included massive cuts in the P.L. 94–142 funds, 25% to 50% over the first 2 years. Other programs assisting the disabled in the schools would have been eliminated or sharply cut back (Murphy, 1983). Steady progress in expanding and increasing federal programs for the disabled, beginning with the small steps under President Eisenhower and continued under each succeeding president, was to be reversed.

When these proposals were considered by the Congress they were not supported, although some budgetary cuts were enacted and program growth slowed in the succeeding years. The experience of many members of the Congress in enacting programs for education of the disabled at state and federal levels resulted in sufficient support to maintain the federal role. In some instances, however, votes in committee may have turned on one or two votes.

The program of benefits for the disabled under the Social Security Act provides additional insight into the changes in federal policy toward the disabled. In 1980 the Congress, concerned by rapidly increasing costs for medical and other benefits under the Social Security Act and responding to reports that nondisabled people were inappropriately collecting benefits, enacted legislation calling for a review of the eligibility of recipients of disability benefits.

Since that time almost 500,000 persons have been cut off from disability benefits ("U.S. Halting," 1984). Without argument, hundreds of thousands of these people were judged inappropriately, and subsequent reviews by courts and by administrative law judges have reversed almost half the cutoffs (Pear, 1984). Meanwhile, there has been tremendous pain and despair. While this story is a complex one, a number of administrative law judges have claimed that they were under inappropriate pressure to cut back on the numbers of disabled

recipients, given quotas or "targets" for approvals, and so on, and, in essence, put under pressure to reduce numbers of recipients without regard to individual determinations of merit.

Under this extraordinary review process, benefits may be terminated before all reviews and appeals are completed so that people suffer an actual loss of continued benefits even though they may later be proven to have been appropriately disabled all along. Several hundred thousand people have had that experience.

The unfairness of this public policy, and the refusal of the administration to halt it while asking for congressional review and relief, led to numerous suits, almost all of which found fault with the administrative practices ("U.S. Judge," 1974). Numerous state governors, whose agencies were responsible for conducting the reviews under federal standards, announced that they were terminating their activities, they included Republican as well as Democratic officials.

Despite this furor, Secretary Heckler and other responsible administration officials have resisted all efforts to end the review program and, in conjunction with the Justice Department, have resisted accepting federal court orders as establishing precedents outside of the area of the specific court. They argue that only a Supreme Court order would be uniformly binding on the administration. A number of federal judges have been outspokenly critical of this posture, and the House of Representatives recently passed revised standards with an almost unanimous vote.[1] While there are real problems with applying uniform and fair standards, and with overall program costs, I can think of no policy of the national government more insensitive to human beings since legal segregation and the internment of the Japanese-Americans.

THE FUTURE

In considering the future, I would like to focus a moment on some general areas of concern that will influence future program directions.

First, there is the fundamental question of the federal role and how it will be defined. We have seen that role change from president to president, although the Congress also plays a powerful role in the initiation and maintenance of programs and policy. Over its first 3 years, it seems accurate to describe the policy of the Reagan administration as being opposed in principle to most existing federal programming for the disabled, and therefore unlikely during the president's second term to want to expand the existing programs or add addi-

[1]Late in 1984, the Congress passed legislation rectifying many of the problems in this program.

tional provisions of a similar nature, such as new federally funded programs to provide services to infants who are disabled.

There is some reason to keep the door of possibilities slightly ajar, given the 1984 Fiscal Year Budget, the first year since 1981 in which programs for the disabled were not scheduled for dramatic cuts. Of course, 1984 was an election year, and the Congress had repeatedly demonstrated its unwillingness to consider dismantling the Education of the Handicapped Act, the Rehabilitation Act, and similar programs. Whether this hiatus from cutbacks was a 1-year phenomenon remains to be seen. Given the record, the nature of the deficit, and his stated reluctance to increase taxes, it seems likely that President Reagan will renew efforts to cut program funds.

Since the newly elected Congress does not appear to be significantly different in composition from the preceding one, major dismantling of programs is unlikely. Democratic members of the Congress may, however, be under pressure from their constituents to support presidential budget cuts, as well as under pressure from other constituents to save programs for the disabled.

In addition to the federal role as it may be defined in programmatic and budgetary terms, there are aspects of the federal role based on attitudes or values that influence the nature of federal actions. For example, in several situations, the administration has indicated that its values may differ from those inherent in P.L. 94–142 and Section 504 of the Rehabilitation Act. This was most graphically demonstrated 2 years ago in the administration's proposed regulation changes that provoked a reported 30,000 or more letters and messages critical of what was seen to be a number of retreats from the due process protections of the law (U.S. House of Representatives, 1982). However, it is possible to look to other examples as well.

In determining the extent of applicability of various civil rights provisions, the administration has frequently followed what might be called "narrow" interpretations of the provisions. In the Grove City College case, the issue was whether discrimination against women was prohibited in the entire college or university which received federal funds or only in the specific program receiving the funds. The administration's position, and that later taken by the Supreme Court, followed the narrower line that only the specific program was covered.

A similar interpretation under Section 504 might mean that the Department of Special Education at the University of Illinois could not discriminate against the disabled because it receives federal special education funds, but the Department of English could if it does not receive such funds. Disabled students may find themselves facing a patchwork quilt of departments and programs, some of which might

be bound to offer them reasonable accommodations, while others would be free to refuse them.

Congressional action will be required to clarify the intent of the statutes prohibiting discrimination in programs receiving federal funds, but my larger point is that the way administrations interpret the law and enforce it, and ultimately argue cases before the courts, will play a powerful role in evolving public policy.[2] It goes without saying that the administration's values will influence the appointment of judges as well as other government officials with administrative and policy responsibilities. For example, recently, the Select Education Subcommittee of the House of Representatives held hearings in which it heard testimony from The Council for Exceptional Children, among others, that efforts to monitor and enforce compliance with the requirements of P.L. 94–142 were failing to meet reasonable standards and had declined markedly in the previous 3 years.

As for the unfinished public policy agenda in special education, these attitudes are clearly involved. The progress made over the last 20 years reflected a willingness on the part of local, state, and federal officials to expend more resources on the disabled and to view certain past behaviors as discriminatory or at least insufficient.

When I was working for and then later working closely with the Congress, some of the more experienced staff members always related the various successes we were having in passing legislation assisting the disabled to the fact that it was not "controversial." We worked very carefully to attain bipartisan support wherever possible and to conduct our activities openly and cooperatively. The experience of these staff members was that controversial programs were much harder to pass. Even when various administrations were lukewarm or mildly opposed to certain programs or actions, the level of the argument in the past was frequently muted. A strong administrative resistance makes legislation that it opposes virtually impossible to pass. In recent years, varying political values of the Congress and the president have tended to provide some checks and balances, so the programs for the handicapped have survived; a different alignment in the future will surely affect this situation.

Discrimination against the disabled is centuries old, and cross-cultural. Our current societal acceptance of the disabled is relatively new and frail. One need only look to the frequent resistance to community housing for the disabled to understand this truth. The strength

[2]In the 1984 Congressional Session, legislation to achieve this purpose, passed the House of Representatives, but failed to get Senate approval. Senator Orrin Hatch, (R.) Utah, Chairman of the Committee on Labor and Human Resources, led the opposition to the proposed legislation.

and values of our political leaders will determine much of our future societal attitudes.

While it seems unlikely that the immediate future will bring a climate in which additional federal initiatives and programs would be supported by the president and/or passed by Congress, I feel the major federal goals for special education should include at least the following:

First, continued effort to ensure the success of P.L. 94–142 through increased resources, appropriate monitoring, and efforts to improve the quality of education provided.

Second, and related to the first in many ways, would be a systematic increase in research and related programs, targeted on improving program effectiveness—that is the teaching-learning process in special education. I would hope that the National Institute for Handicapped Research could be developed into a first-class research institution, similar to the National Institute of Health. (It might be appropriate to change its name to the National Institute of Research on Disability—not only because *disability* is a term favored by many, but because the present title suggests the research is handicapped, perhaps with conscious intent).

Third, evolving public policy should reflect the growing information we have that intervention programs beginning in the early months of life are valuable and should be universally available to disabled children.

Fourth, and for me the last, although there are many more areas that others can add, is expanded emphasis on secondary programming, both vocational and "regular," and subsequent major efforts to increase the numbers of disabled persons who are productively employed and who receive appropriate treatment while employed.

In the final analysis, I have found that public policy reflects the values of the public at large, but that the government leadership, elected and administrative as well as judicial, plays a powerful role in shaping its development and implementation. The values of our government leaders influence the thousands of daily actions that will determine how and whether these future special education agenda are met, and those of us whose values support additional assistance for the disabled must attempt to win current acceptance of our views by our public officials.

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